

MOTOR AGE

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Great Western

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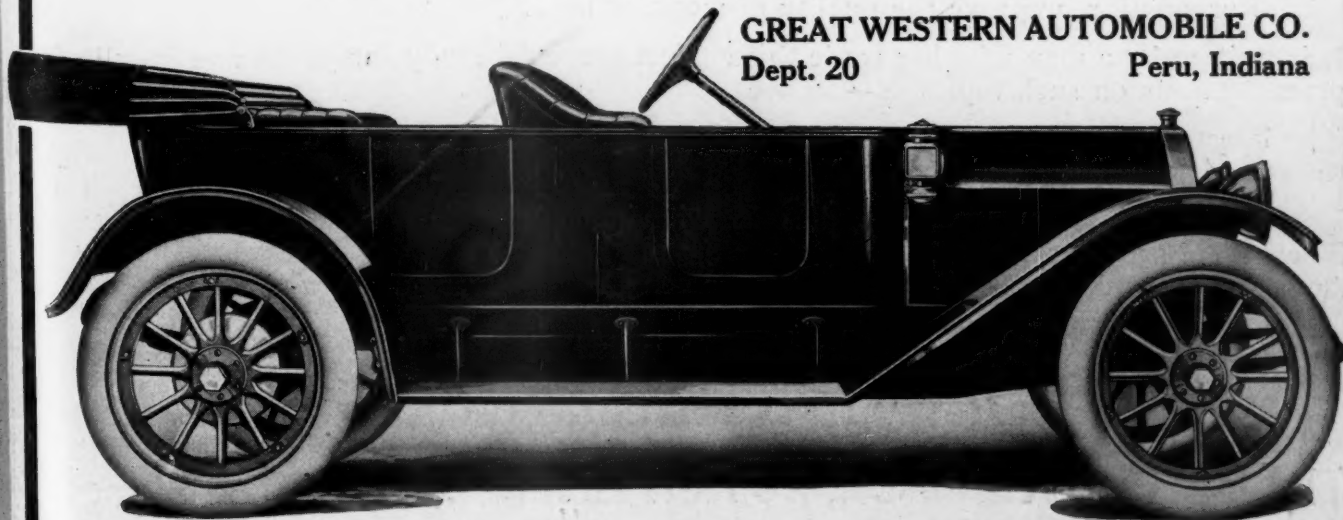
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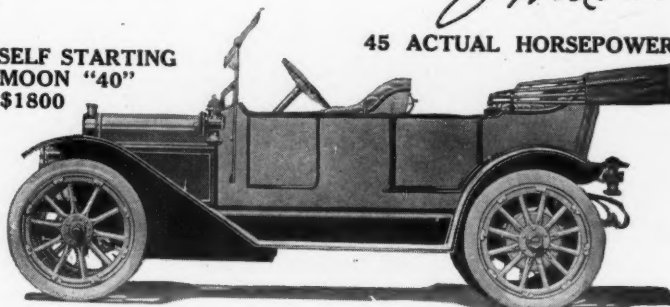
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MOTOR AGE

Motor Bus Now Serious Rival of Trolley



"The motor passenger bus, from its humble origin as an unsightly rubberneck wagon or worn-out touring car adjunct to the rural hotel, is at last coming into its own as an elegant, comfortable and speedy vehicle, competing directly with street railway systems and bidding fair to replace this older and more clumsy method for the higher class of passenger work in our large cities."

By William B. Stout

TWENTY-MILLION dollars is invested in London in motor buses which have been found cheaper to operate than street cars, faster and more comfortable. America is fast awakening to the possibilities of this new traffic and is putting motor buses to work in various fields. New York was the first to adopt this means, using an English type of bus on Fifth avenue. Learning from this experience other cities are taking the motor bus seriously and notably in Chicago.

Within a month motor buses in Chicago will be carrying passengers north and south, while motor buses have been operating the loop district since last September, carrying nearly 200,000 passengers with good success. This is but the start, for, as soon as the riding public finds out what an advance is the motor bus over the noisy and stuffy car, the demand for these new vehicles for service to all prominent points will become insistent. In but a few years the motor bus will be able to solve many difficult transportation problems and give to the citizens of the Windy City the efficient, courteous and uncrowded service which the street railways have been unable to furnish.

The motor passenger bus, from its humble origin as an unsightly rubber-neck wagon or worn-out touring car adjunct to the rural hotel is at last coming into its own as an elegant, comfortable and speedy vehicle, competing directly with street railway systems and bidding fair to replace this older and more clumsy method for the higher class of passenger work in our large cities.

Judging from recent tests in Chicago, conducted by Motor Age, there is a large future for the motor bus, and in the near future business men instead of taking the noisy street car or crowded L train will be able





SAURER MOTOR BUS AT STATE AND MADISON STREETS, CHICAGO, WAITING FOR THE WHISTLE TO CROSS

to take a bus at down town points and be whisked away to their suburban homes with more comfort than ever before, less dirt and noise, and less crowding, making as great speed on the average as the elevated trains.

Streets Are Blamed

The business of any city is based on its transportation facilities and this is true in regard to passenger carrying as well as freight. The chief hindrance to the immediate adoption of the motor bus for all lines of passenger traffic in Chicago lies in the abominable conditions of its streets, many of the main down town surfaces comparing favorably with Napoleon's round cobble pave roads in France, rough and poorly kept and death on tires, springs and rider. Before the truck and motor bus becomes universal in Chicago the old cobble paving in poor repair will have to give way to newer pavement with good surface. With the rapid increase in the use of motor vehicles this change will be soon demanded. At present on account of the awful pavement approach no motor buses run to the Union depot and few taxicabs.

Advantages of the Bus

There are a number of things which will make for the early adoption of the bus, however, from the standpoint of the passenger, the man-on-the-street and the operating company.

The passenger can be taken care of in better fashion than on a street car. The units of transport being smaller will run oftener, and operating on well-paved streets on rubber tires will be to all intents and purposes noiseless, a great gain over other systems, from the standpoint of nerves if nothing more. Stops for taking on and discharging passengers will be shorter and further between on account of the smaller capacity and number carried, enabling the bus to keep a better schedule. There will be no wagons obstructing tracks which must be waited

for, for the bus can turn out and go around the obstruction thus gaining many minutes over the street car in every trip.

In the case of the man on the street, the quietness of the bus will appeal. The noise of street railway and elevated is one of the greatest evils of any big city, and a great drawback to that city's growth. With the bus there will be only the signal noise at street crossings and this less insistent than a street car gong which needs to reach far to make the man in a van ahead hear and get out of the way. The bus can turn out without this noise. The question of street dust will be materially aided as well, for when the truck and motor bus are universally used there will be less of this to contend with, and what dust there is will be comparatively clean. The dust of down town Chicago is a living source of contagion and disease and if the man on the street sees in the motor vehicle a means of getting rid of this danger, motor traffic will get his support, as it has already.

As to the operating company buses can

be run under right conditions on a cheaper basis than a street railway line. The London county council which rules all transportation systems of the English metropolis, operates the street tram system as well as a large number of motor buses. After perfecting the bus systems it finds that the bus investments are paying better dividends than the tram moneys, and that the bus is more satisfactory to a majority of its patrons. All buses on the London streets are subject to the rules of the L. C. C., and this body is most strict in its conduct of everything relating to London streets.

London Likes the Motor Bus

The first motor bus was put on London streets in the summer of 1903 and was received with jeers by both the horse-bus drivers and the populace. Today there are no horse-bus drivers and the populace rides to work in the motor bus, while \$20,000,000 are invested in them in London alone. Such is the change there and much the same change may be looked for here. The first buses were lumbering noisy affairs, easily heard indoors a block away, but the modern bus slips along as quietly as a touring car, though on hard tires. Much stress is laid on this quietness by the L. C. C. and buses must be passed on by a committee before they are allowed on the streets. They must be clean as well, must not smoke under any condition, and be so arranged that oil or grease cannot be spilled on the roadway.

In the early days this was accomplished by a shallow drip pan under the machinery. This was very well on the level runs, but when the buses got to Norfolk street on the embankment and started the climb to the Strand, the accumulated oil of the journey, running to the back spilled on the block pavement from the rear end of the pan until this spot and the foot of every hill on the route became almost impassable for motor vehicles. The



COMING IN FROM SOUTH CHICAGO, WHERE THERE IS LITTLE TRAFFIC

failure was taken care of in short order by the L. C. C. and now the streets are free from such slippery places. Most of the paving of London is creosoted wood block, excellent for motored vehicles, but slippery at times for horse traffic. At these times the streets are sprinkled with sand.

Crowding Not Permitted

Another point on which the L. C. C. is very strict is in the accommodation of passengers. Each bus is marked to hold so many persons inside and so many on the roof. When this number is reached no persuasion can force the conductor to let you on. Not long since where by oversight an extra passenger was allowed in the bus the whole load was summoned, and not only the driver and conductor fined but every passenger in the bus as well, for allowing the extra one on. The enforcement of this rule means that motor bus service in London is comfortable, never crowded, and safe. Bus companies here would do well to enforce the same rule as an attraction to patronage, as a crowded bus is a bad advertisement.

In forming motor bus lines American and Chicago firms would do well to study foreign systems and learn from them lessons which will save money in the end.

The motor bus had its inception in this country in the form of huge sight-seeing vehicles seating several dozen passengers in tiers of cross seats, these being known commonly as rubber-neck wagons. For a continuous trip they did their work satisfactorily but for service making many stops and for taking passengers on and off they were much too cumbersome.

Another branch began when hotel owners bought second-hand touring cars and fitted them up to take the place of the old horse buses running from railway stations in country towns. These worked well for few passengers and for the service they were put to, but were far from being a real bus. The bus finally was



PASSING UNDER VIADUCT IN SOUTH CHICAGO

developed in France and England and at last one of the foremost of the English buses was put into service in New York, running on Fifth avenue. Being a European product, these buses carry passengers on the roof and have been doing good service for a number of years.

Success of New Service

The success of these buses and some few other lines at last caught the attention of the car and truck manufacturers of this country with the result that they began to figure on passenger equipments as a part of their line. These machines were designed for American service and hence are better fitted for most of the needs of our cities than a foreign bus could be. There are few American cities, for instance, where it would be practical to carry passengers on the roof during all seasons of the year, surely not in Chicago. Hence these buses are more like motor-equipped street cars, in the large sizes like the thirty-passenger Saurer shown in the illustrations, or a combination of street car and touring car

with added features, as in the case of the White buses used by Marshall Field in Chicago. These buses are operated by the Chicago Motor Transfer Co., and seat sixteen passengers.

At first there was an attempt with some makers to fit bus bodies on truck chassis, but it was speedily found out that the springing systems of most trucks would not do for passenger service in the smaller types. In the larger vehicles where the body was fairly heavy the springs gave better service.

With passenger work the weight of the load is not great enough to fit truck springs hence the real bus of the future will be reminiscent of truck practice in chassis construction but with the long, wide and flat springs of the well-sprung touring car. With this change the motor bus of today will be as well adopted to its field as the foreign passenger buses are to their conditions. The passenger bus will thus be a compromise between a truck and a touring car.

Springs on the Bus

As an actual basis of reasoning in regard to the use of the motor bus in Chicago, a test was recently run by Motor Age, using a thirty-passenger Saurer bus furnished for the purpose by the International Motor Co., of Chicago. Three main trips were made through the main thoroughfares, west, south and north, besides several shorter trips through congested districts of the loop. Stops were made whose frequency and length was based on street car data obtained by trips a few days previously and the figures taken on a basis of passenger capacity. Since the bus carried thirty passengers and the street car sixty, but half the number of the street car stops was made for the same distance.

The running conditions surrounding the street cars are shown in the data of a trip north from the loop to Wilson avenue during a crowded hour in an annexed



BUS REACHES COMMERCIAL AVENUE AND NINETY-SECOND

BEFORE COLUMBUS MONUMENT IN SOUTH CHICAGO.

column. This shows an actual running time of 44 minutes, making forty-six stops averaging 6 seconds each; a stop every 1.67 blocks; average load, fifty passengers.

On the bus run north it will be noted that 5-second stops were made on this trip, every two blocks down town and as far as Fullerton avenue, every three blocks from there to Devon, where the country is more open, and every five blocks from there on to Evanston.

This was giving the advantage to the street car but even then the bus gained 8 minutes on the car in this short distance. From Lincoln park corner to Howard avenue, the city limits, a distance of 8 miles, six cars were passed, a car every 1½ miles. The time being 36 minutes makes a car passed every 6 minutes between these points. Cars in the loop were not counted, but only those after the congested district was passed, as those conditions more nearly approximate traffic in other places which have no crowded loop.

A complete record of the trips made is shown separately. The first run was west on Madison street. Stops on this route were of 3 seconds duration and as listed, a stop was made every block through the loop to and including Halsted street. From here to Hoyne avenue stops were two blocks apart and from there on every three blocks.

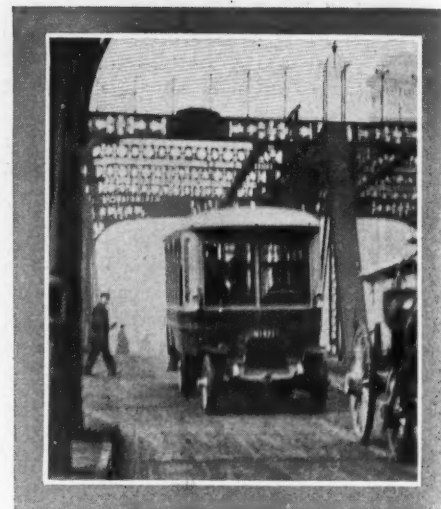
From Halsted to Forty-eighth avenue, a distance of 5 miles, eight cars were passed in 26 minutes. Thus a car was passed every 3¼ minutes and every ⅝ mile. The entire run including stops was made in 41 minutes. Street car schedule is 50 minutes. Total distance, 6 miles.

The second trip was south to South Chicago, a distance of 11.2 miles, thirty-

STREET CAR DATA

Observation Showing Number and Average Time of Stops, Etc.
EVANSTON AVENUE CAR GOING NORTH
February 15, 1912

	Time
Leave Madison and Dearborn....	5:05
Run 1 block, stop 1 second	
1	4
1	10
1	4
1	20
Arrive Clark and Lake streets...	5:09
Run 1 block, stop 3 seconds	
1	1
3	3
1	60
1	2
1	3
3	2
2	8
3	6
2	2
Arrive Lincoln Park corner.....	5:23
Run 1 block, stop 4 seconds	
2	2
1	4
1	5
Park museum at.....	5:27
Run 1 block, stop 2 seconds	
2	4
2	8
1	5
1	6
1	1
1	8
5	4
Diversey boulevard.....	5:33
Run 1 block, stop 10 seconds	
2	6
3	3 (40 passengers)
2	3
1	2
4	9
4	4
1	3
1	2
Halsted crossing.....	5:41
Run 2 blocks, stop 18 seconds	
1	2
2	6
1	4
1	5
1	4
1	3
Sheridan road.....	5:46
Run 2 blocks, stop 5 seconds	
2	3
Wilson avenue.....	5:49
Time, 44 minutes.	
Stops, 46.	
Average length of stops, 6 seconds	
every 1.67 blocks.	
Average 50 passengers.	
Number of blocks, 77.	
Time per block, 34 seconds.	



ON STATE STREET BRIDGE, CHICAGO

MOTOR BUS TEST

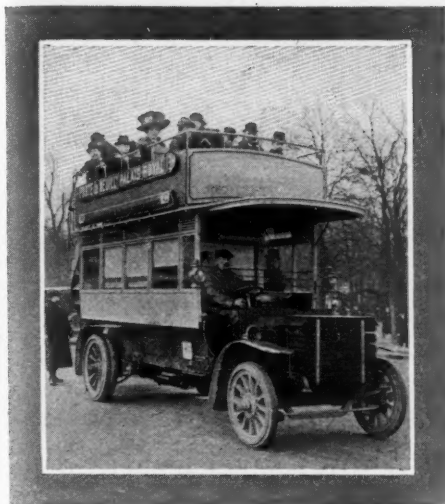
February 18, 1912. Saurer thirty-passenger bus, furnished by International Motor Co.

TRIP, WEST MADISON STREET

	Time
Leave Motor Age office, Karpen building	10:07
Stop every block for 3 seconds, instructions to driver Madison and Michigan, start through loop.....	10:10
Run 1 block, stop 3 seconds	
1	22
1	2
1	5
1	16
Madison and 5th.....	10:15
Stops are over 3 seconds, due to corner congestion. Bus could not keep up schedule in loop; 39 seconds lost in 5 blocks. Average 1 min. per block	
Run 1 block, stop 22 seconds	
1	3
Madison bridge	10:17
N. W. station.....	10:18½
Run 1 block, stop 2 seconds	
2	2
Halsted street, pass car 126....	10:22
Instruct driver stop every 2 blocks from here on	
Run 2 blocks, stop 11 seconds	
1	11 (traffic)
2	2
3	2 Pass car 107
2	4
2	3
2	2
2	2 Pass car 135
1	4
Paulina street.....	10:29
Run 2 blocks, stop 1 second	
2	3 Pass car 216
3	1
2	4 Open country, stop every 3 blocks
3	4
3	3
3	4
Western avenue, pass car 139....	10:33
California avenue.....	10:36
Kedzie avenue, pass car 148....	10:39
Garfield Park pavillon, pass car 5299	10:41
Car barns, catch car 656.....	10:43
Forty-sixth avenue, 6-second stop	10:46
Forty-eighth avenue.....	10:48
Distance, 6 miles, 67 blocks	
Time, 41 minutes.	
Stops, 39, every 1.7 blocks.	
From Halsted on pass eight street cars in 5 miles.	
Road conditions: Wet and muddy. Not in good enough condition for bus beyond Forty-eighth avenue.	
Return trip, leave 10:50, Ogden 11:08, Halsted 11:16, Northwestern station 11:19, State 11:25, Michigan avenue 11:26, Karpen building 11:29.	
Traffic delays out: State and Madison, 5 seconds; Madison and Clark, 4; Madison bridge, 4; Halsted, 11; Curtis, 1; Robey, 2.	



HELD UP BY PEDESTRIANS INSIDE CHICAGO LOOP



A PARISIAN MOTOR BUS

MOTOR BUS VS. STREET CAR TEST

February 18, 1912. Saurer thirty-passenger bus, International Motor Co.

TRIP NORTH, EVANSTON AND RETURN

Twelve passengers

Leave Madison street.....	4:24
Bad approach to Rush street bridge, slows bus to 5 miles per hour	
Rush street bridge.....	4:27
Four minutes lost in approach through traffic and surface	
North State and Ohio.....	4:30
Turn west	
Turn east	
Run 2 blocks, stop 5 seconds	
2	5
2	5
North avenue	4:32
Run 2 blocks, stop 5 seconds	
Driver instructed to make 5-second stop every two blocks to Fullerton avenue, as per comparative street car time taken previously	
Fullerton avenue.....	4:44
Halsted street.....	4:49
Belmont avenue.....	4:50
Irving Park.....	4:55
Two seconds traffic delay	
Montrose	4:58
Wilson avenue.....	5:00
Devon	5:09

Driver instructed to stop every three blocks between Fullerton and Devon. From Devon to Evanston every five blocks. All stops 5 seconds

Howard avenue.....	5:18
Dempster street, Evanston.....	5:22
Davis street.....	5:24

Time, with forty-eight 5-second stops, 1 hour, 4 minutes.

RETURN VIA BOULEVARDS

No stops except for traffic
Start 5:27, via Sheridan road. Boulevard surface hinders speed through necessity for watchfulness on account of holes in road.

Lee and Chicago avenues.....	5:32
Calvary station.....	5:35
Howard and Clark.....	5:38
L and Pratt, 10-second delay at crossing	5:42
Sheridan road	5:46
Wilson avenue.....	5:54
Irving Park boulevard.....	5:56
Lincoln park.....	6:00
Lincoln park corner.....	6:14

Four-minute stop to fill up with oil

Rush street bridge.....	6:19
Stop. Randolph 12 seconds, 4 passengers off	
Adams street.....	6:22
Karpen building.....	6:25

Running time, 51 minutes. Total, with stop for oil, 55 minutes.

Out trip, 12 miles, pass cars 217, 479, 582, 441, 408, 471, from Lincoln park corner on to Howard avenue. Six cars passed in 8 miles.

Bus made after theater trip with party from loop to Evanston in 42 minutes, including two stops.

MOTOR BUS VS. STREET CAR TEST

February 18, 1912. Saurer thirty-passenger bus

TRIP SOUTH TO SOUTH CHICAGO

Leave New Southern.....	1:57
Driver instructed to stop every 2 blocks	
Coliseum	1:59
Eighteenth street.....	2:01
Twenty-second and Cottage Grove	2:03
Bad mud at sides makes bus keep to car tracks, hindering passing of cars ahead	
Pass car 5335	
Pass car 5389	
Thirty-second street, stop every 3 blocks	2:09
Thirty-ninth street.....	2:12
Pass car 5378	
Forty-third street, pass car 5702..	2:15
Forty-seventh street.....	2:17
Fifty-first, straight run.....	2:19
Fifty-eighth, Washington Park...	2:23
Sixty-third, pass car 5446.....	2:25
Sixty-eighth street.....	2:28
Seventy-first, pass car 5387.....	2:30
Seventy-ninth street.....	2:37
Stop for photograph, 2:40 to 2:44	
Columbus statue, South Chicago.	2:50
Ninety-second and Commercial..	2:54
Distance, 11.2 miles; 33 stops.	
Time, 57 minutes; passed six cars.	
Stopped 10 minutes, took on sixteen passengers.	

RETURN

Start	P. M. 3:00
Straight run on car track. Car behind capable of greater speed. Bus gains $\frac{1}{4}$ mile on car every team passed, on account of being able to turn out	
Seventy-ninth street.....	3:12
Forty-seventh street. Traffic delay	3:20
Thirty-seventh street.....	3:31
Twenty-second and Wabash.....	3:40
Karpen building.....	3:50
Five-year-old boy sleeps in front seat.	
Total distance, 22.4 miles.	
Time, with stops, 1 hour, 53 minutes, round trip.	
Running time, return, 50 minutes.	
Pass cars 5435, 5404, 5350, 5444 and 5499, to Twenty-second and Wabash.	

three stops being made in the run of 57 minutes out and six cars passed. Much of the trip was unobstructed with traffic so that the cars had a greater advantage

than usual. The road at the side of the tracks was bad, as well, hindering the bus from swinging past a car in several instances.

As showing the advantage of the bus over street cars for speed a fast interurban street car left South Chicago about three-quarters of a mile behind the bus on the return trip and gained rapidly. When within a hundred yards of the bus a team was encountered on the track ahead. The bus swung out and passed without slowing down to any extent. The street car came almost to a dead stop, while the wagon driver sleepily turned off the track. During the interval of the car's passing, the bus had gained a quarter of a mile. By the time the car caught up again another wagon was met and the same cycle repeated, a third wagon enabling the bus to arrive at the end of the stretch as far in advance of the car as when the race started.

Picks Up Passengers

On the return trip passengers were taken aboard and the run without stops except for traffic, made in 50 minutes. During this time the car ran smoothly enough so that a 5-year old boy went to sleep in the front seat. Six cars were passed on the return.

The third trip was north to Evanston, as in another column. The trip out with forty-eight 5-second stops took 1 hour and 4 minutes; the return by boulevard without stop, 51 minutes.

A special trip was made after the theater by the same bus and made the run to Evanston with a party in 42 minutes, this at a time when there were no traffic delays.

The test of this stage showed that a motor bus could work faster, cleaner and



TRAFFIC SHOWS BUS AND STREET CAR ON MADISON STREET, CHICAGO

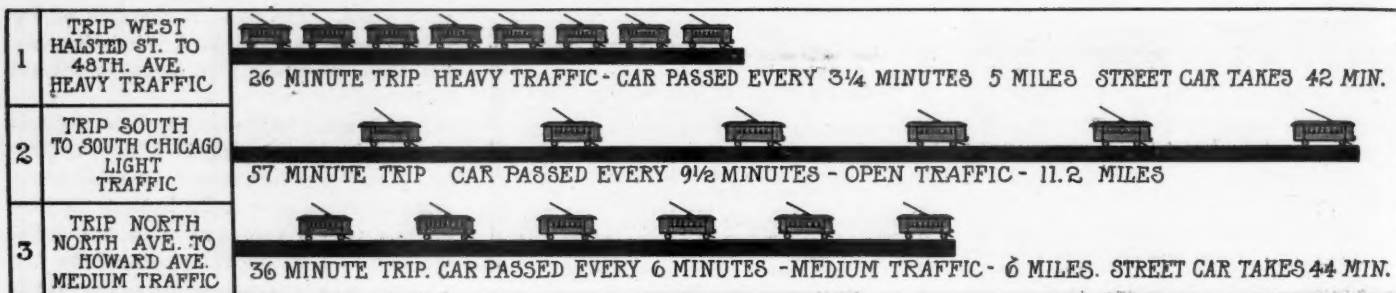


DIAGRAM SHOWING COMPARATIVE SPEED OF STREET CAR AND MOTOR BUS IN POINT OF TIME

more comfortably than street cars, and, when systems are devised whereby they can be kept moving and busy with few delays they can operate as cheaply. The small diagrams show graphically the results of the test of the Saurer bus versus the street car, the distance shown being outside of the more congested parts of each route, for in each case no count was begun of cars passed until the loop congestion had been passed, that the figures might be of more general value to cities where traffic conditions are not so severe as in Chicago's center. Such traffic as was encountered during the counting of the cars passed might be met in any good-sized city. Thus the figures obtained would apply generally to any average city where traffic is severe enough to hinder the street cars from speed. Where traffic is worst the bus will make the best showing in running time compared to the street cars. The buses of the Chicago Motor Transfer Co. make trips from Marshall Field's to the Northwestern station, a distance of ten blocks through the worst traffic of Chicago, in an average of 10 minutes. To make the trip by street car one must allow 20 minutes.

This company is doing much toward motorizing Chicago's passenger traffic, though merely at its beginning and other firms are entering the field. The Marshall Field buses are a start and are carrying from 2,000 to 3,000 passengers a day. On Thursday of Christmas week one of the buses carried 520 passengers. There are ten buses in service at Field's, averaging 250 passengers each, a good showing.

Beginning next month the same firm expects to start a regular business men's bus from Evanston every morning, bringing men from there to the loop without stop, a return trip being made at night. A similar service will run from Wilson avenue, a run of 6 miles. This will be handled on a commutation ticket basis. Club trips are also being arranged for certain groups of men who want to arrange for regular transportation every morning from intermediate points. Starting with these systems it is expected that the demand will shortly become great enough so that a regular service will be established on schedule.

Lines also will be run from the south side as far as Fifty-fifth street on something the same system except that stations will be established on side streets.

Knight Beaten in France

Rolland-Pilain Held Not to Infringe Sleeve-Valve Patents by Judge at Tours—Damages of \$2,400 Awarded—Studebaker Report Announced—Goodrich Denies Rumor Regarding Tire Merger

PARIS, March 2—While the last Paris salon was in progress, the holders of the Knight patents in France, on the order of Knight & Kilbourne, caused a seizure to be made of a sleeve-valve motor exposed by Rolland & Pilain, of Tours, declared to be an infringement of the Knight patents. The case has just been fought out before the civil court at Tours and has resulted in a victory for the local firm.

The court found that the Knight patent was not valid under the French law by reason of failure to show a working within the legal limit, and because of lack of originality. The finding also stated that the Rolland-Pilain patent was a valid one and not an infringement of the Knight.

The local firm was awarded 12,000 francs damages, and the holders of the Knight patent ordered to make ten insertions of the judgment in the press.

STUDEBAKER MAKES REPORT

Detroit, Mich., March 9—The net earnings for 1911 of the Studebaker Corporation approximated \$3,500,000, or a balance for the \$30,000,000 common stock of between 8 and 9 per cent after preferred dividends. Early in 1911 President Studebaker predicted that net profits of the corporation for last year would at least reach this figure. The 7 per cent dividend on the \$13,500,000 preferred stock outstanding requires \$945,000 annually. No dividends are being paid on the common.

Since the turn of the new year the company's business has been of excellent proportions. In January there was shipped the largest number of cars of any similar month in the history of the Studebaker companies. The February output was 4,000 cars and that for March is estimated at 5,000. For the entire year 1912 the company plans to build at least 40,000 cars.

GOODRICH RUMOR DENIED

Chicago, March 12—Rumors to the effect that the B. F. Goodrich Co., of Akron,

O., is interested in a proposed merger of tire interests is indignantly denied by H. E. Raymond of the Goodrich company, who wires Motor Age as follows: "The rumor is absolutely and unqualifiedly untrue. The Goodrich company is not in negotiation with nor has it even consulted with any tire makers with the purpose in mind of effecting any consolidation of any nature whatsoever."

DORIAN DENIES RUMORS

New York, March 11—There is a lively demand for the stock of the Dorian Remountable Rim Co., now held by the estate of the Rosetts, whose banking houses were involved in failure last week. The Rosett failure brought out the fact that the Dorian concern is in excellent commercial condition, a preliminary examination of its books showing, according to Frederick L. C. Keating, attorney, that the company owes less than \$10,000 aside from the indebtedness to the embarrassed banking houses. On the other hand, Mr. Keating says that the assets of the company consist of upwards of \$100,000 of practically liquid items, such as good book accounts and stock on hand. The chief creditors of the company, says Mr. Keating, are supporting the institution temporarily by not pressing their claims pending the transfer of the financing of the company from the Rosett banks to some other moneyed source.

DECISION FAVORS WEED

New York, March 9—Judge Lacombe, sitting as magistrate in the United States district court for the southern district of New York has upheld the motion of the Weed Chain Tire Grip Co. for a preliminary injunction against the Atlas Chain Co., of Brooklyn. The chief question involved was as to whether a snug-fitting chain infringed the Parsons patent. It was shown that the Atlas chain, equipped with strong tension spring causing it to fit closely to the tread of the tire, still crept slowly.

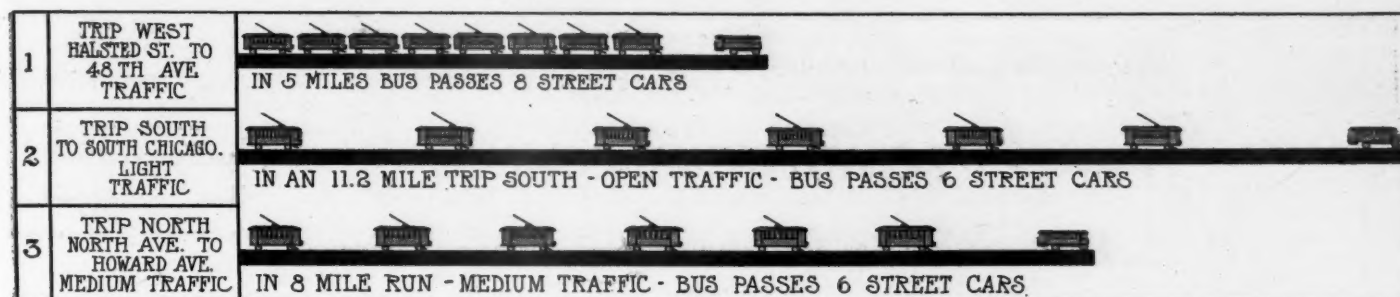


DIAGRAM SHOWING COMPARATIVE SPEED OF STREET CARS AND MOTOR BUS IN TERMS OF MILES

Creditors Tie Up W.C. & P.

Petition Throws Into Bankruptcy Court Makers of Vaughan and Commer Cars—Liabilities Placed at \$700,000; Assets, \$500,000—Suit Said to Be Friendly—New Yorkers Fight Tire-Marking Bill

NEW YORK, March 13—Special telegram—Wyckoff, Church & Partridge, Inc., was petitioned in bankruptcy yesterday afternoon. Creditors representing claims of \$20,500 joined in the petition. John S. Sheppard, Jr., was appointed receiver under bond of \$250,000. In addition to its large establishment at Fifty-sixth street and Broadway, the company has a manufacturing plant at Kingston, N. Y., where it made the Guy Vaughan car and the Commer truck.

It was roughly estimated that the liabilities would reach \$700,000. The assets are in the neighborhood of \$500,000, both estimates being made by the creditors.

On behalf of the company the following official statement was made: "The application for receivership was made by friendly creditors to conserve the assets of the company for the creditors and stockholders. Our assets exceed the liabilities by more than \$500,000 and our present difficulty is due entirely to the fact that our production has been delayed by something over 5 months and our available cash capital was not sufficient to carry us to the point of turnover. It simply is a case of arranging with the creditors to give us a sufficient extension of time so that we can get our production through, and we expect to resume soon."

The company was formed as the Standard Automobile Co. in 1903. It was expanded to a capitalization of \$500,000 as the Decauville Automobile Co., and in 1906 was called Wyckoff, Church & Partridge, with \$1,000,000 capitalization. In May last year the form of corporation was changed again and a bond issue of \$200,000 was authorized. At that time the company merged with the W. A. Wood Mfg. Co. of Kingston.

FIGHTING TIRE-MARKING BILL

New York, March 13—Special telegram—A stiff fight is being made by dealers, jobbers and manufacturers of tires to defeat the Chanlor bill, now pending in the

New York legislature which provides that all motor car tires sold in the state shall be branded, tagged or marked with the date of their manufacture.

The position taken by the dealers is that the bill serves no valuable purpose to the user and will embarrass the dealer. It is pointed out by the United States Tire Co., Goodrich, Ajax and several other companies that storage for 6 months under proper conditions is an absolute benefit to the tire and that a year's storage will not materially injure the merchandise. The usual manufacturers' warrants cover stored tires and the practice of buying mileage rather than tires would be the same under any circumstances.

The dealers' movement has the support of the Motor and Accessory Manufacturers and an informal discussion of the situation was held at the headquarters Tuesday and it was decided to reinforce the dealers at Albany. With this in view a delegation of fourteen was named to make the trip to Albany yesterday.

IMPORTANT PATENT RULING

Washington, D. C., March 11—A decision of importance to inventors was handed down today in the United States supreme court which upholds the right of patentees to dictate absolutely how their patented articles may be sold by retailers, and declares legal the inventor's monopoly in his selling contracts. The case involved alleged infringement in selling supplies for use on a patented rotary mimeograph, a notice on the machine setting forth that it was sold on the restriction that it was to be used only with supplies made by the patenting company.

The decision was backed by the majority of the court, and a dissenting view was taken by Chief Justice White and Justices Hughes and Lamar. The chief justice holds that such a construction as the majority places on the law would enable the holder of a limited patent to reach out and by contract include within the patent

every conceivable thing used in every American household.

On the other hand, Justice Lurton declares that the conclusion resulted from the proper construction of the patent statutes. The very object of the statute, he claims, was to give a monopoly to the inventor, and the fact that he continues that monopoly in his contracts disposing of his articles by charging such prices as he pleases was not illegal.

THE RUBBER MARKET

New York, March 12—Crude rubber has been strong since the middle of last week, advancing to \$1.19 for nearby options on up-river while plantations, based upon first pale crepe reached \$1.38. In the New York market fine up-river touched \$1.14½ yesterday. Trade was light in the higher grades, but medium varieties moved in fairly large lots.

Under light trading, both locally and in London, the market Tuesday turned very strong and advanced to \$1.17½, based upon fine upriver.

NEW RAMBLER GUARANTEE

Kenosha, Wis., March 13—The Thomas B. Jeffery Co. has announced that it will give a 10,000-mile signed guarantee on its cars. President Charles T. Jeffery, in making this announcement, mentions that 96 per cent of the Rambler parts is made at the factory.

WILL MARKET ARGO OUTPUT

Chicago, March 11—The Metzger-Herrington company, just organized, has taken over the output of the Argo Electric Vehicle Co. of Saginaw, Mich., and will make its headquarters in Chicago. The new concern has undertaken to dispose of all the electrics the Saginaw concern will make for 1912 and has secured the building at 2412 Michigan avenue, formerly occupied by the Cadillac. Carl J. Metzger, formerly sales manager of the Woods Motor Vehicle Co., and Roy Herrington, who was assistant sales manager of the same concern, are the prime movers in this new company, the former being president and the latter vice-president.

NEW YORK CONCERN BANKRUPT

New York, March 12—Voluntary bankruptcy proceedings were commenced today on behalf of the Crawford Automobile Co., of New York, which operates a garage. Wilder Bellamy was named receiver. The assets are estimated at \$2,500 and the liabilities \$2,344.

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MOTOR AGE

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The Assassination of the Tire

SOLID rubber tires have literally been assassinated—worn out is not the correct expression. Abuse is not in the proper category, when the trials of the tire have to be cited. Here are some examples from tire users on big trucks:

Example 1—Our trucks give excellent service. They are 5-ton machines, but on busy days we carry as high as 10 tons. The machines move off with a 10-ton load apparently as easy as when carrying but 5 tons. Our only trouble with the motor truck is tires.

Example 2—Our 5-ton truck gives the best of service. We think a mistake was made in not putting on a larger body. We frequently use a trailer with a 5-ton load and the trucks can handle this extra load with as great ease as the normal load. We do not keep close track of the truck cost, but the tire upkeep is the big item.

Example 3—Our 3-ton trucks are satisfactory in every way but tires, they wear out remarkably fast. We invariably carry loads of over 5 tons without any apparent injury or trouble.

THESE three examples were not made up in this office. They were received by letter from the users of the trucks. The three examples come from cities over 500 miles apart. The three tell the same story, namely, overload and expensive tire upkeep. In each case the tires were not given a ghost of a chance. Two users frankly admit and boast of 100 per cent overload and in the third case it is nearly as great.

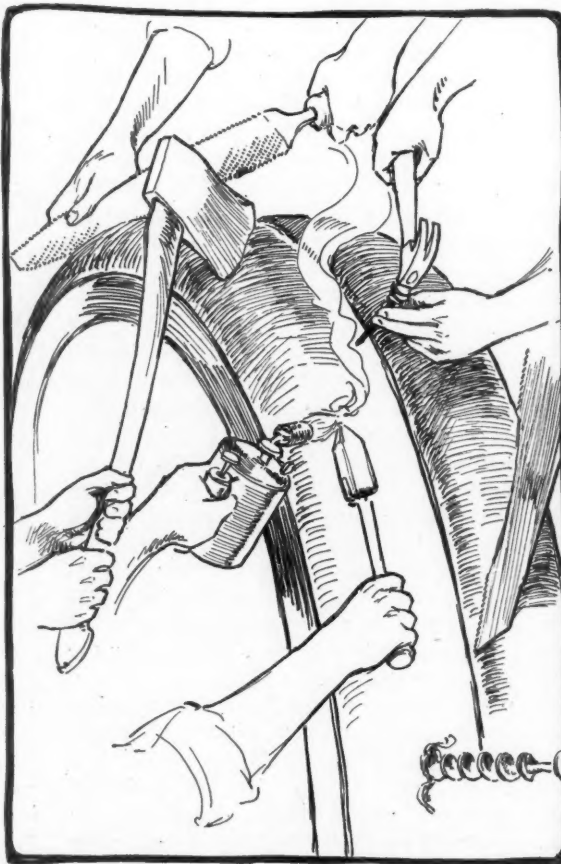
IT would be interesting if the case could be followed still further and find just where the overload idea originated. Perhaps it was the glib-tongued salesman who mentioned the possibility of a 100-per cent overload and it may have been on one of the demonstration trips that such claimed truck prowess was first impressed upon the truck buyer. At any rate the seed was sown; and still worse nothing was said about the injury to the tires because of the overload.

SOLID tires are iron armored looking affairs. They seem to be invulnerable. Many a driver makes it a point to run over a glass bottle in the street to see how he can crush it to bits, in fact into a powder. It is a fact that in one or two cities drivers have boasted about what they have done in this matter. Of course when the bottle is crushed the tire goes on about the same as before. It cannot be punctured; apparently it cannot be injured very much. The

driver fails to realize that a tire can be injured without being apparently much damaged. He is greatly mistaken.

THE injury to truck tires was well demonstrated to the truck committee of the National Association of Automobile Manufacturers at its truck convention last week. S. V. Norton in his address on injuries to truck tires before this organization told of how a single case of overload permanently injures a solid rubber tire whether on a 1-ton delivery wagon or on a 5-ton truck. A digest of his remarks was published in Motor Age last week and the complete address appears on other pages of this issue. Just as the elastic band which is stretched too far breaks and cannot be repaired, so with the solid rubber tire that is compressed too much. Its injury is not so apparent as that of the broken band, but it is none the less there.

THE assassination of the tire is not entirely due to the overload, it often is due to too much speed. When a truck carrying its normal load is rushed at speed over a rough street car crossing the tire is just as surely injured from that one offense as if it were run for several miles with a 100-per cent overload. Still another case: A driver abuses his truck by too quick starting and too sudden stopping by braking. Such unnecessary acts generate intense heat in the tire with the result that the work of vulcanization is undone and a permanent damage results. There is still another great offender in the matter of truck tire destruction, namely, fast driving with loads over bad pavements. The unexpected hole into which the truck wheel drops in the pavement is just as destructive of tire life as the heavy overload, the too high speed or the injudicious braking.



ABUSING TRUCK TIRES

TIRE abuse is costing the truck industry hundreds of thousands of dollars every year. In London some of the big trucks are getting as high as 30,000 miles out of a set of solid rubber tires, yet there are cities in America where the tire maker will not guarantee 8,000 miles. The deplorable conditions of the street pavement are responsible for this. It is further a fact that it is possible in America to get nearly twice as much tire mileage in one city as in another, due solely to the street pavements. This situation suggests the fact that truck makers have a big burden to carry. Part of this burden is the actual work of selling machines, but a big part of it consists in demonstrating to city councils and street commissioners the fact that the introduction of the motor truck demands better street pavements.

Grand Prix Entry Europe's Greatest

PARIS, March 2—With a total of fifty-eight cars, the lists for the grand prix race of the Automobile Club of France closed on the evening of March 1. It is the largest number of cars ever got together for an international European race, outside of the German Kaiser preis, and is clear proof of the change of opinion that has come over manufacturers since the last big race was held at Dieppe in 1908.

This year's grand prix provides for two classes of cars: with a cylinder volume of 183.08 cubic inches and a minimum weight of 1,763 pounds empty, and without any restriction whatever. The two sets of cars will be run together for 2 days over a total distance of 1,000 to 1,200 miles, which is the greatest distance ever imposed for an open road race. The prize of \$4,000 will be awarded to the maker of the fastest car, in whichever class he may be entered, and the regularity prize of \$2,000 for the best team performance will be given without class distinction.

The race will be held at the coast town of Dieppe, 100 miles from Paris, during the second fortnight in June, probably towards the end of the month. In order to obtain the race this district has offered a subsidy of \$20,000 to the sporting committee of the Automobile Club of France.

JANUARY EXPORTS AND IMPORTS

Washington, D. C., March 9—The high-water mark in the exportation of motor cars was reached in January, when 2,047 machines, valued at \$1,955,290, were shipped abroad. During the corresponding month of last year the number of cars exported was 924, valued at \$969,930. During the 7 months of the fiscal year ended January, 1912, the number of cars exported was 9,944, valued at \$9,789,894, while during the same period of last year the number of cars shipped abroad was 4,817, valued at \$5,845,222. Exports of parts, except tires, showed a big gain, the records showing a raise in value from \$165,369 in January, 1911, to \$472,601 in January last, and from \$1,063,124 to \$2,080,299 during the 7 months' period.

The shipments of cars during January and the 7 months ended January, 1912, were as follows:

Exported to—	No.	January Value	Seven months No.	Value
United Kingdom	719	\$508,324	3,104	\$2,453,748
France	20	12,012	200	180,513
Germany	15	8,874	73	58,563
Italy	12	8,093	83	58,673
Other Europe	119	106,801	466	403,461
Canada	404	481,413	1,956	2,472,135
Mexico	46	64,973	204	318,168
West Indies and Bermuda	20	17,377	166	171,680
South America	187	240,536	907	1,061,857
British Oceania	402	402,199	2,108	1,918,716
Asia and other				
Oceania	65	72,536	492	515,099
Other countries	38	32,152	185	179,281

A slight increase in the imports of cars is indicated by the official figures. The number of cars imported increased from

Race to Be Run at Dieppe in June—Chicago Seeks to Control Pedestrians

sixty-nine, valued at \$137,727, in January, 1911, to eighty-four cars, valued at \$199,197, in January last, while during the 7 months' period the imports increased from 545 cars, valued at \$1,145,220, in 1911, to 644 cars, valued at \$1,406,328, in 1912. Imports of parts, excepting tires, decreased in value from \$33,574 in January, 1911 to \$25,145 in January last, and from \$195,529 to \$182,951 during the 7 months' period. The imports of cars during the periods under consideration were as follows:

Imported from—	No.	Jan., 1911 Value	No.	Jan., 1912 Value
United Kingdom	8	\$24,050	25	\$58,341
France	36	57,205	38	102,770
Germany	13	34,041	6	13,955
Italy	7	13,095	10	11,942
Other countries	5	9,336	5	12,189

Imported from—	No.	Jan., 1911 Value	No.	Jan., 1912 Value
United Kingdom	68	\$152,161	130	\$292,576
France	257	527,319	223	545,596
Germany	76	171,182	92	204,182
Italy	97	184,142	101	147,643
Other countries	47	110,416	98	216,331

Grand Prix Entries

BIG-CAR CLASS, NO LIMITATION

Car and Country	Driver
1—Lorraine-Dietrich, France	.....
2—Lorraine-Dietrich, France	.....
3—Lorraine-Dietrich, France	.....
4—Peugeot, France	.....
5—Peugeot, France	.....
6—Darracq, France	.....
7—Darracq, France	.....
8—Darracq, France	.....
9—Mathis, Germany	..... Mathis
10—Ford, America	..... Depasse
11—Excelsior, Belgium	.....
12—Fiat, Italy	..... Bruce-Brown
13—Fiat, Italy	..... De Palma
14—Fiat, Italy	..... Wagner
56—Rolland-Pilan, France	.....
57—Rolland-Pilan, France	.....
58—Sigma-Knight, Switzerland	.....

LIGHT-CAR CLASS—183 CUBIC INCHES AND 1,763 POUNDS

15—Lion-Peugeot, France	..... Boillot
16—Lion-Peugeot, France	..... Goux
17—Darracq, France	.....
18—Gregoire, France	..... Porporato
19—Gregoire, France	..... De Marne
20—Gregoire, France	..... Romano
21—Gregoire, France	..... Medinger
22—Sunbeam, Gr. Britain	.....
23—Sunbeam, Gr. Britain	.....
24—Sunbeam, Gr. Britain	.....
25—Sunbeam, Gr. Britain	.....
26—Singer, Gr. Britain	.....
27—Singer, Gr. Britain	.....
28—Vauxhall, Gr. Britain	..... Hancock
29—Vauxhall, Gr. Britain	..... Watson
30—Vauxhall, Gr. Britain	..... Ferguson
31—Alcyon, France	..... Barriaux
32—Alcyon, France	..... Page
33—Alcyon, France	.....
34—Vinot-Deguingand, France	..... Vonlatum
35—Vinot-Deguingand, France	..... Molon
36—Vinot-Deguingand, France	..... Molon
37—Sizaire-Naudin, France	..... Sizaire
38—Sizaire-Naudin, France	..... Naudin
39—Sizaire-Naudin, France	.....
40—Arrol-Johnston, Gr. Britain	.....
41—Arrol-Johnston, Gr. Britain	.....
42—Arrol-Johnston, Gr. Britain	.....
43—Calthorpe, Gr. Britain	.....
44—Calthorpe, Gr. Britain	.....
45—Calthorpe, Gr. Britain	.....
46—Schneider, France	.....
47—Schneider, France	.....
48—Koecklin, France	..... Koecklin
49—Cote, France	..... Gabriel
50—Cote, France	.....
51—Hispano-Suiza, France-Spain	..... Derney
52—Hispano-Suiza, France-Spain	..... Pillverdie
53—Hispano-Suiza, France-Spain	.....
54—Hispano-Suiza, France-Spain	.....
55—Lorraine-Dietrich, France	.....

CHICAGO, March 11—A radical step in the controlling of traffic inside of the loop, Chicago's business district, will be taken this year if the wishes of the police are heeded by the city authorities. Captain C. C. Healey of the mounted police, a great student of traffic congestion, has recommended that an ordinance be passed giving the police power to control pedestrians the same as they do the drivers of vehicles. That ordinance will be offered to the city council shortly. If it is passed it will mean that pedestrians will have to mind the whistle at the down town crossings. When the vehicle traffic is going north and south the pedestrians headed east or west will be held in check. Those pedestrians who do not heed the police signal will be arrested. It is expected that 3 months of this will educate the public so that the efficiency of the traffic squad will be increased 100 per cent. It also is calculated that accidents will be reduced to a minimum.

As conditions exist now, pedestrians pay no heed to the police. They dodge between vehicles that have been given the right of way, slowing them and often causing accidents. If Chicago passes this law it will be the first American city to have such an ordinance.

TRAIL TO MEXICO COMPLETED

Los Angeles, Cal., March 9—Just 2 months to the day was required to pathfind the Pacific highway from Los Angeles to the City of Mexico, as T. J. Beaudet, representing the Pacific Highway Association arrived in the City of Mexico the last day of February and left Los Angeles on the stroke of 12:00 o'clock at midnight, January 1. The pathfinder was met by a large delegation of government officials and escorted to the capitol building, where Beaudet was presented to President Francisco Madero.

The Pacific highway has been covered by motor car practically the entire length of the North American continent. The actual points north and south are Hazelton, B. C., which is within 60 miles of Alaska, and the City of Mexico on the south. The total distance is 5,700 miles. More than two-thirds of this is now open for comfortable motor travel 8 months out of the year.

Complete information can be secured concerning any part of this route from the international headquarters of the Pacific Highway Association, located at Seattle, by motorists who are thinking of touring this territory.

SAVANNAH NOT ANXIOUS FOR RACE

Savannah, Ga., March 9—The Savannah Automobile Club today announced that it will not take the initiative in staging the grand prix next fall. The matter came up at the annual meeting of the club.

Illinois Starts Its Good Roads Boom

CHICAGO, March 13—Three hundred and fifty earnest advocates of good roads in this state were brought together yesterday afternoon and evening at the Hotel Sherman by the Chicago Motor Club and the Chicago Automobile Club, the result being the formation of the Illinois Highway Improvement Association, which starts with 225 on its charter list, made up not only of motorists, but bankers, farmers, members of the state legislature and prominent citizens of the smaller cities of the state. In fact, it was the most representative good roads gathering ever brought together in this state. The various organizations actually represented at the banquet last night represented 20,000 residents of the state, so the power of the new organization is apparent.

Officers chosen for the new association were as follows:

President, W. G. Edens, Chicago; vice-presidents, S. E. Bradt, De Kalb; C. A. Kiler, Champaign; C. G. Miller, Cairo; Mayor F. A. Garner, Quincy; treasurer, Thomas Sudduth, Springfield; secretary, Richard J. Finnegan, Chicago; directors, O. W. Hoyt, Geneseo; J. B. Maguire, East St. Louis; Philip Freiler, Elgin; M. D. Ode, La Salle; Henry Paulman, Chicago; Eugene Funk, Bloomington; H. G. Herget, Pekin, and Charles George.

Speakers at the banquet in the evening included Homer Tice, chairman of the state legislature's good roads committee, who presented a mass of figures showing how far back Illinois is in the good roads movement. Thomas J. Tynan, warden of the Colorado penitentiary, told of his system of utilizing convicts on the road, illustrating by means of moving pictures the fine roads of his state, built by convicts.

WOULD OPEN NATIONAL PARKS

Washington, D. C., March 10—In the senate yesterday Senator Warren of Wyoming introduced a resolution, which was agreed to, calling on the secretary of the interior to submit the names of national parks in which motor cars are permitted to enter. The senator also desires to know what the secretary of the interior is doing in the way of opening up Yellowstone park to the motorists. Also he wants an estimate as to the cost that would be entailed in building new roads or changing the present ones so that motor cars could be admitted to the big park.

BAY STATERS PROTEST TAX

Boston, Mass., March 11—The committee on roads and bridges of the Massachusetts legislature gave a hearing this morning on the recommendation of Governor Foss that the motor cars be further taxed to secure more money for the roads. In his message he stated that \$1

Highway Improvement Association Formed at Chicago Meeting—Bay Staters Object to Tax

per horsepower would save more than that amount to the car owners in repair bills if applied to the upkeep of the roads. So he recommended that not less than 80 cents nor more than \$1 be charged. Colonel W. D. Sohler of the highway commission was the first speaker in favor of the bill. He admitted that the commission had caught up with the work of maintenance and that the sum received now from the motorists was enough until a larger mileage of state roads were built. He said that he knew motorists who were willing to pay the increased fee. Many prominent motorists spoke against the measure.

JERSEY RECIPROCITY HANGS FIRE

New York, March 12—Reciprocity in New Jersey still needs one vote more in the senate in order to pass the Stickel bill. A conference on the measure was called for last night, but no action was taken. It is probable that an amendment will be tacked on the bill in the senate, in the event of favorable action. This will be to raise the rates of registration full 50 per cent.

MORE DYER SUITS STARTED

New York, March 12—The Enterprise Automobile Co. of Hoboken, N. J., has entered five suits in equity in the United States district court for the southern district of New York, charging infringement of the Dyer transmission patent and the other basic patent held by that organization. The suits were directed against Egerton L. Winthrop, Jr., who owns a Charron car; Mrs. Sara G. Bronson and E. Suydam Grant, who have Isottas; C. A. Glenworth, importer of the Napier, and Fred W. Sewell, importer of the Minerva.

All the suits are similar to the cases now pending between the Enterprise company and various manufacturers, the Automobile Board of Trade and users of several types of cars. The bills ask for an accounting, injunction and damages in each case and such other relief as the court may decree.

The usual course for these cases to take after service is for an appearance on the April rule day, which will be April 1. A perfunctory order for answer on May rule day will probably be entered in April, but the actual answers may not be forthcoming until June, and it is possible that the suits will not be at issue until after summer vacation.

It is quite likely that the court may

order all subordinate suits involving identical facts and law to await the decision in the main cases which, as has been stated, include actions against the Locomobile Co. of America, Winton Carriage Co., Maxwell-Briscoe Motor Co. and the Saurer company.

DEATH CLAIMS TRADESMAN

Detroit, Mich., March 11—Joseph A. Chene, general superintendent for the Foster Motor Sales Co., and a pioneer in the mechanical end of the local motor car industry, died last week of uraemic poisoning at his home here, at the age of 35. Mr. Chene built the first single-cylinder Olds runabout and later, while in the employ of Leland & Faulkner, worked on the single-cylinder Cadillac.

TIRE LEATHER DUTIABLE

Washington, D. C., March 9—An importation of chrome-tanned cowhide leather invoiced as "chrome motor-tire leather," imported by a New York firm, was the subject of a decision by the board of general appraisers. Duty was assessed at the rate of 15 per cent ad valorem, under paragraph 451 of the tariff act of 1909, and strips or treads forming a part of the importation were assessed at the rate of 40 per cent under paragraph 452 of said act. Various rates of duty other than that assessed were claimed by the importers. The board ruled that chrome-tanned cowhide leather for tires is dutiable as "band, bend or belting leather," under paragraph 451 of the tariff act of 1909, rather than as "leather not specially provided for," under the same paragraph. The board also ruled that strips of chrome-tanned leather, beveled and cut into lengths and shapes suitable for use as motor car tire treads, are not dutiable as manufactures of leather, under paragraph 452, tariff act of 1909, but are subject to the provisions in paragraph 451 of said act for "band, bend or belting leather," and leather cut into forms suitable for conversion into manufactured articles.

CAMERON QUILTS OVERLAND

Toledo, O., March 12—Announcement was made today by W. H. Cameron that he has resigned his position as chief engineer and designer of the Willys-Overland Co. Mr. Cameron had been with the Overland people for 3½ years. At the present time Mr. Cameron has made no plans for the future.

KENTUCKIANS BEAT BAD BILL

Louisville, Ky., March 12—Special telegram—After a stubborn fight in the house of representatives, the Newcomb motor bill, considered one of the most drastic measures of its kind ever introduced in the general assembly, was defeated.

Boston Show Beats Attendance Record

BOSTON, Mass., March 9—Boston's annual motor show ended this evening with new records credited to it in several ways. There were more cars exhibited; there were more makes represented; there were more dealers present; there were more cars sold; and there were more visitors present. When the doors closed to-night Manager Chester I. Campbell stated that a new record for attendance had been reached by Friday and the old figures of a year ago, when 180,000 were present, would be buried, for the totals would show the number of visitors at approximately 225,000. These figures seem large, of course, but the factory men from the west who have seen all the big shows for years, stated that never had they beheld such throngs as were present in Boston, particularly on society day when the prices were doubled.

The show represents in sales perhaps \$2,000,000, according to what some of the men who have a passion for getting at the bottom of things and particularly like to get at figures, could find out. It is estimated that at least 1,200 cars were sold during the week. To those who know New England conditions this is not strange. Of course a large number were contracted for by dealers, but the great bulk of the sales were made at retail. This means that about 25 per cent more cars was sold than last year when the estimate placed the number at about 900. As an indicator it is believed that about one-tenth of the cars registered as new machines or increased registration in the state are bought at show time. This means now that if the ratio keeps up there will be more than 10,000 cars added to the Bay State figures for 1912.

As a business proposition the dealers were all satisfied. The men who had the small cars naturally sold the greater number. It was surprising to see the interest displayed all week, and the salesmen were on the job all the time. The fact that some of the concerns had men delivering lectures on the materials used such as the Flanders, Chalmers, Rambler and Everitt, was something new and caused many to stop and investigate. This led to orders, for the New Englanders wanted to be shown and the more explanations they got the better they liked it.

LOUISVILLE WELL SATISFIED

Louisville, Ky., March 9—Never before has the motoring public been favored with such an exhibition that approached the annual show which closed tonight. It was by far the best business show that ever has been held here and is the last of the 1912 motor shows down on the calendar to be held south of the Ohio river. Although the exact figures cannot be had because of the tendency of

Approximately 250,000 Persons Attend Exhibition— Sales Total \$2,000,- 000—On Circuit

some of the dealers to keep their sales secret, a canvass of the various exhibits disclosed the fact that more than 100 cars had been sold. They included gasoline, electrics and commercial vehicles. The interest in the last-named type displayed by southern manufacturers, merchants and business men was marked throughout the show and indicates that there will be a steady demand for the commercial car in Kentucky during the coming season.

In point of attendance the show surpassed all expectations. Despite 2 days of inclement weather, a steady stream of visitors flowed through the doors of the armory. It is estimated that not fewer than 22,000 people saw the display the last day. The attendance of the manufacturers indicates that they have realized the importance of Louisville as a distributing point for the southern output. According to the men from the factories, no other city controls the sale in so large a section as does the metropolis of the Blue Grass State.

DENVER'S OPENING AUSPICIOUS

Denver, Colo., March 12—Special telegram—The greatest show in Denver's history opened in the Auditorium tonight. Forty-seven exhibitors are showing 115 trucks and passenger cars and the boxes are filled with fifty attractive accessories displays. The weather has cleared up after weeks of snow and fog and indications point to record-breaking crowds. Four thousand people were on the floor opening night, 1,000 in excess of last year. Every train is bringing hundreds of visitors from entire western United States. Dealers never were so enthusiastic over the motor outlook, especially for rural trade, and hundreds of country people who are spending the week in Denver are live prospects. More emphasis placed on trucks than in any previous show.

SYRACUSE SHOW OPENS

Syracuse, N. Y., March 12—The biggest show Syracuse ever has had opened to-night, in the Armory and Alhambra, the two largest buildings in this city, being attended by large crowds, including many visitors from all northern and central New York State.

OMAHA PROVES A WINNER

Omaha, Neb., March 9—A meeting of the members of the Omaha Automobile Dealers' Show Association was held last week, at which it was reported that the show this year had a most far reaching

influence. Financially both in point of sales and in gate receipts the show was the most successful ever held. Clarke Powell, who has managed the show for several years, was chosen manager for the 1913 show.

The dealers decided to hold an open week show, in the fall, probably during the Ak-Sar-Ben carnival. Instead of the cars being shown in the Auditorium, each dealer will have a private exhibit in his show room, but they will combine in advertising the show, in lighting the streets, etc.

EUROPEAN JOB FOR GEORGE

Toledo, O., March 13—Claude A. George, assistant sales manager of the Willys-Overland Co., leaves March 20 for Europe to locate permanently there as the foreign representative of the Willys-Overland Co. Mr. George will have entire charge of the European export department. On his arrival in Europe a convention of the English Overland representatives, thirty-two in all, will be held in London, March 27. After this, offices will be opened at Hamburg, Germany.

GERMAN FACTORY IN JERSEY

New York, March 12—Rudolph Chillingworth, of Nurnberg, Germany, recently purchased the lot, factory, machinery and equipment of the Chicago Railway Equipment Co., on West Side avenue, Jersey City, N. J., and will commence immediately to manufacture special motor car parts. The feature of the Chillingworth line is an improved type of differential housing. It is understood that three other German factories are contemplating establishing American branches in or near Jersey City.

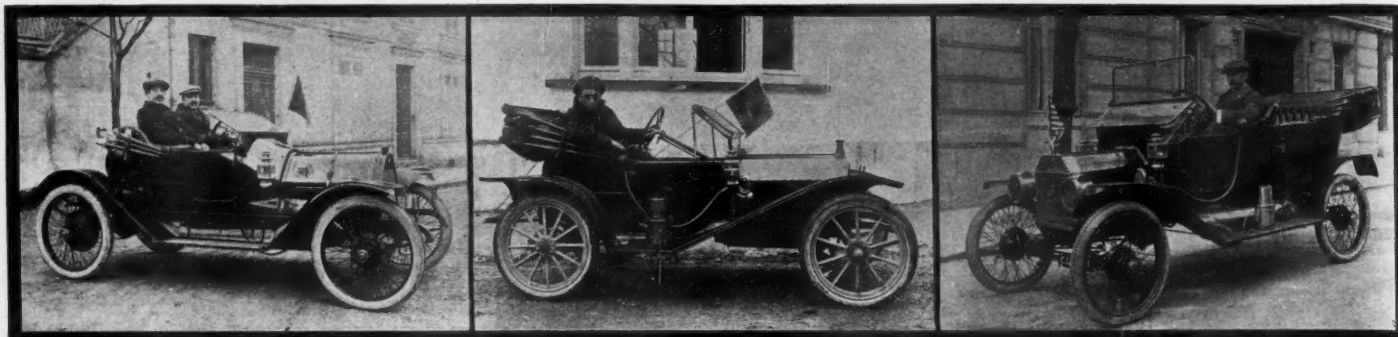
CORRECTING WRONG IMPRESSIONS

New York, March 12—Some confusion has arisen because of an article appearing in Motor Age of March 7 recounting a decision of Judge Noyes in the United States district court defining and limiting patent litigation. It was not stated in the article that there must be a diversity of citizenship in order that the United States courts may take jurisdiction. As that is the usual practice in the federal courts, except in certain well-defined instances, it was deemed unnecessary to restate it.

BUSINESS DONE AT COLUMBUS

Columbus, Ohio—The Columbus show, which was held in the federal building at Third and Chestnut streets, for the week ending March 9, was a success in every particular. From the standpoint of the exhibitors the show was the best ever held in central Ohio. Many sales were reported during the week and more prospects were secured for attention later in the season.

French Tour a Business Proposition



THREE AMERICAN CARS IN FRENCH TOUR—REO, HUPMOBILE AND FORD

PARIS, March 2—Starting from the suburbs of Paris before daybreak, sixty-one cars undertook the initial run in the French reliability from the capital to Nancy, a distance of 200 miles, forming the first of the fifteen stages of the 2,500-mile run round France.

Though designated a competition, the business nature of the tour is more pronounced than the competitive side of the event. It is the beginning of the active touring season, practically all the big towns of France are passed through, and if immediate sales are not the direct outcome of the trials everybody will be disappointed. In reality it is a traveling motor show, for every manufacturer has put in his latest models and will display them to prospective customers who cannot be reached by the Paris salon. Local agents look upon it as an excellent opportunity to stir up enthusiasm and clinch sales.

Three American Makes In

Although the old-established big-car manufacturers have not thought it worth while to appear in the tour, despite the fact that all of them build the \$1,600 chassis eligible under the rules, the younger and more vigorous firms have eagerly seized the opportunity, and have been joined by three American agents doing business in France: Ford, Reo, and Hupmobile. A Reo three-seater has been put in the hands of the veteran race driver, Gabriel; the second car, a two-seater runabout, with a torpedo body on European lines, has one of the firm's demonstrators at the wheel. Both the Reo and the Ford cars are equipped with detachable wire wheels of French origin. The little two-seated Hupmobile is making the tour with the driver only aboard.

This being one of the most complete collections of light cars ever got together in France, it is interesting to note that the European tendency is towards four-cylinder motors of less than 3.1 inches bore. The majority either had 2.7 or 2.9 inches bore, while a few were as low as 2.5 inches bore. A very common dimension was 2.9 by 4.7 inches bore and stroke. Two-seated torpedo bodies were in a slight

Foreigners Make Light of Contest Side and Seek Sales—Mechanical Features of the Cars

majority, the others being four-seated torpedos, with a sprinkling of fully-closed bodies. There was only one car presented without fore-doors, and in practically every case the bonnet merged into a scuttle dash. A very large percentage of the cars carried their gasoline tanks built in the dashboard.

The importance attached by manufacturers to the tour was clearly indicated by the careful preparation in nearly all cases. The Benz team, for instance, comprising three four-cylinder models of 2.8 by 4.7 inches bore and stroke, all had been fitted with expensive two-seated torpedo bodies; each carried two spare wire wheels, compressed air tank, a most complete outfit of spares and tools in the rear compartment, acetylene side and head lamps, a high-grade waterproof cover for the top, and all three drivers and mechanics were equipped with black leather suits having the word "Benz" on front and rear. In addition to this most complete outfit, a powerful car accompanied the competitors and carried a big supply of gasoline, oil, tires, spares, soldering outfits, vises, and many workshop tools.

French Tendencies

The French makers did not consider it necessary to push elaborateness to such a degree, and in the case of the two-seaters practically the entire outfit was placed in the rear compartment, the only external fittings being either a spare tire or spare wheel. This left at least one running board fully free and added to the clean appearance of the car. In the full touring models, however, there was a general lack of space for luggage, unless the rear seats were used for this purpose.

According to the regulations the cars had to average 18.6 miles an hour for the entire distance, everything in connection with the car being carried out during the

running time. There was a certain laxity with regard to what could be changed, the opinion being that the necessity of keeping up the average would make any important repairs impossible. There also was an idea that if a car was so simple that an important part could be changed on the road without lowering the average, it should not be penalized for what was in reality a good quality. Among the competing machines were three Cid cars fitted with a rotary-ring valve, in place of poppet valves. This type of motor has been produced by the Cid company for 1 year, and a number of cars with the non-poppet motor are on the road, but this is the first occasion on which one has appeared in a public test.

Special Class for Runabouts

In addition to the light cars with a maximum chassis and tire price of \$1,600, a special class was provided for light runabouts selling complete at not more than \$800. It is a type of car which has come very much to the front in both France and England during the past year, where the need is felt for something capable of filling the gap existing between the motor cycle and the small car. The price, if possible, for this class of motor car should not be more than \$500. There were ten entries in this class, three of them having very small four-cylinder motors, three twin-cylinder air-cooled motors, and four with one-cylinder motors.

One of the latest models, and also one of the most original, was the Dumond, which carried a single-cylinder water-cooled motor of 3.3 by 6.6 inches bore and stroke set across the front of an ordinary channel section frame, and having a large diameter steel disk on each extremity of its crankshaft. Fiber-faced drums mounted on the squared portion of a long propeller shaft were in contact with each of the two disks, and the rear extremity of each shaft carried a bevel pinion meshing with a crown bevel wheel on the rear axle. This gave a direct drive through from the motor to each road wheel, and as the propeller shafts were about 6 feet in length, there was no necessity to make

provision for displacements by reason of the rise and fall of the axle. Obviously the bevel gearing was enclosed, as in the case of a shaft-drive car, yet the axle was more in the nature of a dead than a live axle. Being driven from disks on opposite ends of the crankshaft, the two propeller shafts turned in contrary directions, but as the bevel pinions attacked the crown bevel wheels from opposite sides, the rotation of the two road wheels was in the same direction. The two friction pulleys had the usual fore and aft motion, and were connected together so as to be operated by means of a side lever.

Mechanical Features

Provision was made for taking up wear in the friction pulleys by lateral adjustment of the brackets carrying the propeller shafts at their forward ends, this adjustment being made from the outside of the frame. The motor had very large diameter valves and high-tension magneto, but on the whole conformed to standard design. Although this car has just been brought before the public, it has been under test for over 2 years with very satisfactory results, it being declared that there is a total absence of slip even under the most adverse conditions. It probably will be marketed with four-seater body and all fittings at \$750 to \$800.

Another newcomer in this class was the C. L. C. with a single-cylinder rotary-sleeve valve motor. The sleeve has a single opening serving to uncover the intake and exhaust ports in the cylinder wall. It has been under experiment for a considerable time, but has only recently been produced commercially, and even the competition model was brought out with a very roughly put together body. The Bedelia is practically a four-wheel motor cycle. Its twin-cylinder air-cooled motor drives by chain to a jack shaft and the final drive is by two V-section belts; a fore and aft movement is provided the rear axle to get the correct tension on the belt and to allow of slackening off for de-clutching.

German Three-Wheeler

The Phanomobil is a German three-wheel production having a twin-cylinder air-cooled motor carried over the front wheel and drive by means of chains. It is a type of car not likely to meet with any success in France. In the Sphinx, a very promising car of this class, the single-cylinder motor transmits by flat belt to a two-speed and reverse gearset, and has final drive by single chain. The car has a narrow track and long wheelbase, thus the two seats are staggered, the driver being slightly ahead of the passenger. This gives ample leg room, without the two persons being in one another's way. This car is one that promises to be produced very extensively in Europe. All these light voitur-ettes are designed specially for French and English conditions and are intended to reach that big class wishing to obtain the advantages of a motor car at little more

than the cost of a motor cycle. There are indications that there will be a big boom in this class during the next 2 years.

Fords Are Disqualified

New York, March 11—The three Ford cars in the French reliability have been disqualified, according to a cablegram from Paris today. It is said that a protest against them was filed by several of the entrants, among them Benz and Hupmobile, an objection being made to the advertising methods adopted by the entrants of the Ford.

SUGGESTS TOURS INSTEAD OF RACES

Syracuse, N. Y., March 9—Frederick H. Elliott, secretary of the Touring Club of America, has suggested to the New York state fair commissioners that a series of club runs be arranged to take the place of the races at the state fair here next September. The tragedy of last year has abolished the possibility of further racing here. Mr. Elliott proposes that the state fair commissioners expend \$1,500 in cups to be competed for by the clubs of Albany, Rochester, Utica, Binghamton, Elmira, Buffalo and other cities for runs to Syracuse during the fair. A secret time would be set for each city and the driver coming nearest it would be awarded the cup for his locality.

WARREN MAKES NON-STOP RECORD

San Francisco, Cal., March 7—Between 300 and 400 miles are being cut daily from the world's non-motor stop record. The Warren Wolverine, which last Saturday evening bettered the world's record of 10,074 miles, made a long time ago by the Maxwell, is still traveling along serenely, and apparently can keep it up indefinitely. At 1 o'clock Wednesday afternoon the car had covered a little more than 12,000 miles, or almost 2,000 miles better than the old world's record.

The work of the Warren is even more

notable than appears on the surface, for its real mileage is some 5,000 miles greater than that officially accepted by the American Automobile Association. The attempt to win the record began on January 20. After the car had been running continuously for 11 days a piece of waste clogged the carburetor, necessitating a stoppage for more than an hour and officially ending the first attempt to win the world's mark. After the carburetor had been cleared, the motor was started again on February 4, although 5,396 miles that had been negotiated counted for nothing. The running has been over the roads of Alameda county.

The entire test has been carried out under the direction of Percy J. Walker, western representative of the American Automobile Association, from which sanctions were obtained.

NEW ORLEANS AFTER TOUR END

New Orleans, La., March 11—That the A. A. A. reliability tour will end in New Orleans practically was assured at a meeting Friday night when Colonel Frank M. Joyce, of the executive board of the A. A. A. advised the members of the Louisiana Motor League that this city is generally favored for the run. Evidence was presented of the ability of the city to raise the \$4,500 which would be necessary to secure the tour. Most of the time at the meeting was taken up in the discussion of the route between Louisville and New Orleans.

Two possible routes have been proposed, one by way of Memphis and another, which would take the tourists over a more eastern course, would lead through Chattanooga. The majority of the persons present were in favor of the Memphis route. Colonel Joyce left Saturday for Panama, where he will make arrangements for the entertainment of the tourists on their arrival on the Isthmus.



WARREN THAT BROKE NON-MOTOR STOP RECORD

Spring Styles in Motoring Toggery



1—Two-snap tourist cap with flap turned down, covering ears

2—Same cap with back turned up and buttoned on top

3—Raccoon coat, the best wearing for motoring use

4—English cloth gaberdine, rubberized with light English waterproof lining

Latest Ideas for Men Illustrated and Described—Summer Is Not Here Yet, So Owners Should Sally Forth Well-Equipped to Defy Chill of the Evening

who would have comfort and at the same time get value for his money.

It is rather a perverted sense of economy which prompts a man to try to drive his car without suitable clothing for the purpose. The average business man pays from \$35 to \$50 for his business suit, and if he attempts to save on the special clothing which he wears in the car, especially when long trips are taken, by wearing this good business suit unprotected, he soon will get into trouble. For door hinges will catch pockets and rip them, exposed sharp edges will snag the cloth, grease will get on the coat and the pants, and before he knows it the \$45 invested in the suit has to be followed by another \$45 for another suit.

Saving One's Good Clothes

The man who protects his good clothes by suitable coats or other garments will get more enjoyment out of the trips he takes, and even if his outlay is \$50 or more a year for motor clothing, at the end of that time it is a safe bet that he has saved more money than the man who tried to practice too great economy by trying to get along with his regular clothes.

For cold weather touring, caps, fur hats and coats, heavy cloth coats, over-boots and all kinds of gloves are manufactured. These range in price between very wide limits, so that the man who wishes to spend \$500 for an outfit can be as well satisfied as the one who does not care to go above \$50. The supply stores are well stocked with all the necessities and the luxuries which go hand in hand with the rest of the car's equipment.

Caps and Other Headgear

In the line of caps and other headgear, there seems to be nothing to be desired, for there are shapes and varieties to meet every taste and purpose. There are the two-snap tourist caps which have flaps at the sides to come down over the ears, and which fold up over the top of the cap when not in use. These are not very expensive and can be bought for about \$1 or \$2 at the outside.

There is the semi-racing style made in light and gray mixtures and in light or dark gray mohair. These run up to \$2.50. The ear flaps are made so that they tie up over the top of the cap when not in use.

Editor's Note—Motor Age is indebted to the Auto Supply Co., 1789 Broadway, New York, of which George H. Robertson, former racing driver, is president, for the use of the motor toggery worn by the models who posed for the accompanying illustrations. Photographs taken expressly for Motor Age by Lazarnick, New York.

A NUMBER of things must be considered in the buying of early spring motor clothing. The question of wearing qualities, service and economy usually are looked into rather thoroughly by the man

Now Claim the Attention of Car Users

It Has Been Demonstrated It Is Folly to Attempt to Economize by Wearing One's Business Clothes on Tours and Short Trips—Tailors to the Rescue

Among the fur styles are those of raccoon, Australian opossum, natural or blended muskrat, electric seal and genuine seal. These are made in a number of shapes, the most popular being the one which will come down over the ears if desired, but which is normally folded up along its sides. The vizor type of fur headgear is not popular. Prices on fur caps run from \$3 to \$20, according to the fur.

Semi-Racing Fur Cap

The semi-racing fur cap is a rather peculiar model. It is designed to fit closely over the head, and there is a very small vizor of leather. It has ear flaps and ties up over the top in much the same manner as the ordinary racing cap. This may be bought from \$5 to \$15, depending, of course, on the fur.

Fur and fur-lined coats for man retain their prestige as being about the best possible thing for early spring driving. For the ones which have the fur outside you can pay anywhere from \$35 for a Manchurian dogskin affair to \$250 for one of the finest quality raccoon skin models. Other furs which are extensively used for this class of garment are Amur bear, Australian opossum, Russian pony, natural South American beaver, Russian calf, natural muskrat and combinations of blended furs or skins. Perhaps one of the most serviceable, although by no means the least expensive, is the Russian pony skin in brown which has a collar of natural beaver. This sells for about \$145.

Fur-lined Coats

Among the fur-lined coats, the same variety is placed before you. Black broadcloth usually makes the backing against which the fur shell is placed. A very nice coat of this class is the one which is lined with marmot and has a collar of blended muskrat. This model has a variable price, according to the quality of the fur, but it does not exceed \$75.

Muskrat-lined coats with collars and cuffs of Persian lamb are very much worn, and they involve an outlay of about \$125. For \$145 you can get a gray or brown cheviot coat which is lined throughout with natural raccoon skin or natural muskrat and which has a collar of either fur. If your means are ample, \$400 will get you a broadcloth coat which is lined through-

out with natural mink, the collar and cuffs being of the same expensive fur.

For motor use, however, the coat which will give the most service is the one illustrated here, and which is made of raccoon. Depending on the quality of the fur and the workmanship, coats of this kind range in price from \$65 to \$250. The fur is very durable and does not readily wear off in places where there is a good deal of rubbing.



1—Boots with four buckles. Lambs' wool linings
2—Sammain-lined gauntlets; ear flap cap; waterproof coat and goggles—a good outfit
3—Front view of overcoat with convertible collar
4—Back view of same coat, showing its hang and cut



From left to right—Pony-lined coat with Persian lamb collar. Broadcloth shell. Cloth coat with a detachable leather lining, absolutely wind-proof. Racing or work suit in khaki cloth, a one-piece model. Australian opossum-lined coat with same kind of collar. Also Sammain lamb-lined gauntlet gloves

Heavy overcoats with convertible collars are very much in vogue, not only for street wear but for all around service in the car as well. They are of all shapes, colors and prices, and for the man who does not care to put a large amount of money into a fur model, they are amply satisfactory. They may be had for almost any price, ranging in most cases from \$15 to \$50. The convertible-collar or military models are much worn, for they may be used with the collar snugly buttoned at the throat or with rolling lapels. Thus, when the car is speeding along, the close-buttoned neck piece is very acceptable, but when the run is ended, such extreme buttoning and bundling up of the throat is not necessary for comfort.

Coat with Detachable Lining

Among the newer coats is the one which has a detachable leather lining. This is shown in one of the illustrations. The lining renders the garment absolutely windproof, as well as waterproof. If desired, the inner lining may be used separately as a coat, or it may be used in combination with another coat. The price of the coat and its inner lining is \$45.

A very nobby garment—in the parlance of the clothing salesman—is the Irish frieze coat, which also has a convertible collar. It is amply heavy for ordinary touring weather, and a very good wearing reputation goes with it. In the supply store they will sell you this style for \$35.

The ulster model with roll collar has a rather exclusive air about it which makes it attractive. The price is somewhere in the neighborhood of \$50. The material is chinchilla, which is very soft, and if in its natural color, is pearl gray.

Mackintoshes, rubberized coats, gaberdines and dusters are to be found in profusion. These all are very serviceable garments, and at least one type should be part of every tourist's wardrobe.

The most commonly used type of waterproof coat is the one which is made of rubberized material, and which may be buttoned up tightly around the neck to the complete exclusion of all water. This coat is light in weight and it also serves admirably as a duster. It has flaps at the ends of the sleeves, so that the latter may be drawn tightly around the wrists in rainy or windy weather. The quality of the material determines the price of this type of coat, although a very good one can be purchased for \$12. The purchaser may go as low as \$5, if he likes or as high as \$25.

Another serviceable coat is the one which is made of English gaberdine cloth,

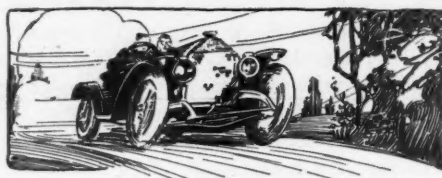
rubberized with light English waterproof plaid lining. This model is very exclusive, according to the supply house man, and is among the new importations for the discriminating. This is priced at about \$15.

A very good coat which sells for \$57.50 in some of the stores is rather distinctive in appearance, and its cut is a little out of the ordinary. The under sides of the collar and cuffs are faced with soft tan Danish leather. There is a front box plait effect and cross pockets. A single-breasted model of waterproof Burberry cloth in tan or olive shades has met with a great deal of favor. It is made with an imported camel's wool plaid lining for \$55, and with a heavy blanket plaid lining for \$35.

Another New Style

A double-breasted model with a high band collar completes the list. Beginning directly above the waist line in the back, a wide inverted plait extends to the end of the skirt, giving the coat extreme width when a sitting position is assumed. This particular feature recommends it as an extremely comfortable model, and the price comes to \$30 or \$40 according to the cloth.

For the chaffeur, the supply dealer carries a variety of grades of cloth suits in standard yoke Norfolk models and in plain models with plaits on either side. These are priced from \$18.50 to \$45. All of the suits are rendered showerproof, and they come in worsted cloths and whip cord.



Service is the keynote of their manufacture.

As to gloves, the dealer in supplies can furnish you with anything from the short glove to capeskin with ball-and-socket snap at the wrist to the heavy gauntlet or fur type. A very good gauntlet glove of capeskin, lined either with imported wildcat fur, sheepskin or natural muskrat may be had for \$6 to \$8. Fur gloves range in price from \$5 for the short, fleece-lined glove of electric seal to \$15 for the gauntlet glove of raccoon which is lined with sheepskin. Short gloves of genuine seal can be bought for the surprisingly low price of \$10, while Australian opossum gloves lined with sheepskin cost \$11.50. In one of the illustrations a pair of Sam-mian lambs' wool lined gauntlet gloves is shown. These come at about \$6.

Many novelties in motor wear have been brought out, among which is the motor shirt which is made in black, tan or white rubber. It really is a coat, but there are no buttons, and it is put on over the head. The neck fastens with a drawstring, and the front with ball-and-socket snaps. On the inside, from the neck half-way down, a shield of rubber affords protection against rain, wind and dust. The cuffs are elastic and fit snugly around the wrists. An exceptionally wide skirt helps to make the coat serviceable and comfortable under all conditions. In black, the dealer asks \$6.50 for this novelty, and in



red, tan and white, \$10. Another style of motor shirt with a V-neck in place of the drawstring model just mentioned, can be had for from \$10 to \$12.50.

Men's over-boots, which are made to slip on over the shoes are also among the later novelties. They are made in a variety of leathers and fasten with about four buckles, making it easy to put them on or take them off. The insides are lined with lambs' wool, and there is not much possibility of freezing the feet when they are a part of the wearing apparel of the motorist.

For Knockabout Use

For working around the car and for wear when racing, a one-piece suit has been brought out. This resembles the little night suits sometimes inflicted on small children, buttoning up the front in much the same way. There is a belt which is a part of the combination. At the bottoms of the pants and the ends of the sleeves, there are tabs for drawing the pants and sleeves in tightly around the ankles and wrists to the exclusion of dust and dirt. These suits may be bought for

some such amount as \$5, and they come in khaki cloth.

For sums ranging from \$18 to \$50, regular suits of clothes which have been cravenetted for touring, to render them waterproof, can be had. These are in every other respect like regular business clothing.

Yes, Spring Pants

Did you ever hear of spring pants? Yes, there are such articles, and they will cost you from \$5 a pair to perhaps \$100, if you want fur ones. In construction, they consist of five steel bands or springs which are open at one side, and over which the material, whether it be rubberized cloth, leather or fur, is placed. There are two of these spring bands to go around each leg, while the top one is made larger to clasp around the waist. The first of the leg springs goes around the leg above the knee, while the other clamps around the ankle. When the motorist is ready to go, he springs the upper band around his waist, and the others around his legs, making a very snug fit. The garment is waterproof, very serviceable and ideal for cold weather.

Clothing manufacturers and supply dealers are constantly raking their brains to get out new things to add to the comfort of the man or woman who drives a car, and the wonder is as to what will be brought out next.



From left to right—Waterproof coat of mackintosh variety. Another view of the same coat. Irish frieze coat with convertible collar, new design. Ulster with roll collar. Exclusive model in chinchilla

COLUMBUS, O., TO RICHMOND, VA.

COLUMBUS, O.—Editor Motor Age—Please give me the best route from Columbus, O., to Richmond, Va. Also advise me how early in the spring this journey can be made with comfort and safety.—W. J. Joyce.

Traveling over good roads to Zanesville through Granville, Newark, Hanover, Nashport and Irville, you follow the National highway to Washington, D. C., by way of Bridgeville, Norwich, New Concord, Cambridge, Washington, Elizabethtown, Fairview, Hendrysburg, Morristown, Lloydsville, St. Clairsville, Bridgeport, Wheeling, West Alexander, Claysville and Washington, D. C.

The Richmond stretch is through Arlington, Annandale, Fairfax, Aldie, Halfway, Plains, Bethel, Warrenton, White Sulphur Springs, Jeffersonstown, Rixeyville, Locustdale, Orange, Green Spring, Trevilians, Louisa, Cuckoo, Montpelier, Goodall, Glen



Routes and Touring

some of the points made are Raton, Los Vegas, Blanchard, Santa Fe, Albuquerque, San Marcial, Rincon—at which place a right-angle turn is made northwest to Silver City and Lordsburg. Having crossed New Mexico diagonally, shortly over the border in the state of Arizona, Wilcox is reached, proceeding thence to Benson, where another sharp angle is made, leading almost due north to Winkelman, thence west through Florence to Phoenix.

From this point the remainder of the trip is over the course of the Los Angeles to Phoenix race. Passing through Winter Wells and Salome, fair roads are to be found from Phoenix to Vicksburg. At

obtained from the Blue Book, volume 3.

A choice of route may be had from Albuquerque through Holbrook to Flagstaff, from whence by a short side run a visit can be made to the Grand canyon. Continuing from Flagstaff via Prescott to Phoenix, from the last-named place another side trip to Roosevelt dam, by which great engineering and irrigating project 240,000 acres of arid land are reclaimed, and the cities of Phoenix, Tempe and Mesa are furnished with water, light and power. The motorist has also a choice of route from Phoenix through Agua Caliente and Dome to Yuma, running across the boundary into Old Mexico, and back into the states at Mexicali, thence to Calexico and El Centro and through Campo to San Diego. From San Diego to Los Angeles the route lies over the Pacific highway, often in sight of the ocean, and along the road broken by the Jesuit fathers, and past three of the old missions located at San Diego, San Juan Capistrano and Santa Ana.

IOWAN SEEKS INFORMATION

Iowa Falls, Ia.—Editor Motor Age—As soon as roads settle in the early spring, I want to take a motor trip covering the following points: Streator, Ill., Washington Court House, O., Washington, D. C., Jamestown, N. Y., and from there home to Iowa Falls. What is the best road to take, and is there a route book which substantially covers this trip? Will an Iowa 1912 license plate be a sufficient protection through the states to be traversed, or will I be compelled to obtain others on the way, if so in what states?—J. H. Funk.

Suppose you motor to Newton and then over the river-to-river road to Davenport, Ia., through Eldora, Gifford, Union, Albion, Marshalltown, Laurel, Newton, Kellogg, Grinnell, Brooklyn, Victor, Ladora, Marengo, South Amana, Homestead, Oxford, Tiffin, Coralville, Iowa City, West Liberty, Atalissa, Moscow, Wilton Junction, Durant and Davenport. Crossing the Missouri river into Illinois, continue to Streator through Moline, Brier Bluff, Geneseo, Atkinson, Annawan, Mineral, Sheffield, Wyanet, Princeton, Hollowayville, Seatonville, Peru, La Salle, Ottawa, Grand Bridge and Streator.

With Washington Court House as your objective point pass through Dwight, Reddick, Goodrich, Kankakee, Momence, Sherburnville, Lowell, Cedar Lake, Crown Point, Thayer, Enos, Morocco, Brook, Foresman, Goodland, Fowler, Oxford, Otterbein, Montmorenci, Lafayette, Elston, Romney, Crawfordsville, Whitesville, New Ross, Jamestown, Lizton, Pittsboro,



FERRYING A CAR ACROSS THE COLORADO RIVER AT EHRENBURG, ARIZ.

Allen, and Richmond. If you care to visit the Bull Run battleground, after leaving Fairfax go to Centerville and Manassas. Returning a short cut into the previous road outlined would be through Bristoe, Catlett, Calverton, Midland, Remington, Elkton, Brandy, Inlet and Culpeper. This Washington-Richmond road is a good dirt one and has been covered in 9 hours in dry weather. You will travel through a very rolling country, and it is best for you to wait until the frost is well out of the ground.

DENVER TO LOS ANGELES

Denver, Colo.—Editor Motor Age—Will Motor Age kindly give me what they consider the best southern route from Denver to Los Angeles, also the distance, as I am intending making the trip shortly?—H. G. Brown.

Leaving Denver via the Great North and South Highway your route will lie through Littleton, Sedalia, Perry Park, Colorado Springs, Skinners, Buttes, Eden, Pueblo, Minnequa, St. Mary's, Walsenburg, Aguilar, El Moro, Trinidad and Morley in Colorado. Following the Santa Fe trail from Trinidad, soon after leaving Morley, the state line is crossed. Continuing into New Mexico

Quartzite you will be 300 miles from your destination. At Ehrensburg motor cars are ferried across the Colorado river into California. From Chuckawalla to Don Palos and beyond will be found the hardest traveling of the journey, as washes, gullies, dead sand and heavy grades are to be encountered. At Mecca good roads are to be expected. The remainder of the journey leads through Palm Springs, White-water, Banning, Beaumont, San Bernardino, Pomona to Los Angeles. Regarding the route from Lordsburg to the coast, a distance of 704 miles, information can be

NOTICE TO CORRESPONDENTS.

Motor Age has received communications addressed to the Routes and Touring department from the following named towns and nom de plumes:

Burlington, Wis.—A subscriber.

Aurora, Ill.—A Reader.

Dallas, Tex.—O. U. M. Age.

—R. W. Trowbridge.

These communications will be held until the proper signatures have been received. All communications written over a nom de plume must bear the writer's signature, otherwise such communications will not be answered. These signatures are wanted as proof of the authenticity of the inquirers.—Editor Motor Age.

Information

Brownsburg, Clement, Indianapolis, Cumberland, Greenfield, Cleveland, Charlottesville, Knightstown, Raysville, Ogden, Dunreith, Lewisville, Strawn, Cambridge City, Centerville, Richmond, Westville, Hope, Eaton, W. Alexandria, Johnsville, New Lebanon, Kingsville, Dayton, Xenia, Jamestown and Washington Court House.

Traveling to Williamsport, Circleville, Amanda, Lancaster, Rushville, Somerset and Zanesville lands you on the National highway, and you will keep on this road all the way to Washington, D. C. The itinerary is: Bridgeville, Norwich, New Concord, Cambridge, Washington, Elizabethtown, Fairview, Hendrysburg, Morris town, Lloydsville, St. Clairsville, Bridgeport, Wheeling, West Alexander, Claysville, Washington, Beallsville, Brownsville, Uniontown, Somersfield, Petersburg, Keyser's Ridge, Grantsville, Frostburg, Eckhart, Cumberland, Flint Stone, Hancock, Clear Springs, Hagerstown, Funkstown, Benevola, Boonsboro, Middletown, Braddock, Frederick, Urbana, Hyattstown, Clarksburg, Gaithersburg, Rockville, Dupont Circle and Washington, D. C.

En route for Jamestown, N. Y., you might motor to Baltimore, Md., through Stanton, Blagdensburg, Hyattsville, Laurel, Relay and Catonsville; Baltimore to Harrisburg; Owings, Reisterstown, Finksburg, Westminster, Union Mills, Littlestown, Gettysburg, Heidlersburg, Dillsburg, Shepards town, Harrisburg; Harrisburg to Williamsport; Dauphin, Clarks Ferry, New Buffalo, Liverpool, Independence, Port Trevorton, Selinsgrove, Shamokin Dam, Northumberland, Milton, McEwensville, Muncy, Montoursville, Williamsport; Williamsport to Jamestown; Trout Run, But-tonwood, Liberty, Nauvoo, Morris, Antrim, Brownlee, Wellsboro, Ansonia, Galetton, Brookland, Coudersport, Roulette, Port Allegheny, Smethport, Farmers Valley, Braddock, Custer City, Kinzua, Warren and Jamestown. Stow, Chautauqua, Mayville, Westfield, Northeast and Wesleyville land you in Erie.

Between Erie and Chicago the towns are Fairview, Girard, East Springfield, Con-neaut, Amboy, Ashtabula, Saybrook, Geneva, Unionville, Madison, Painesville, Men-tor, Willoughby, Euclid and Cleveland, Rocky River, Dover, Bement, Ridgeville, Elyra, Amherst, Henrietta, Birmingham, Berlinville, Norwalk, Monroeville, Belle-vue, Clyde, Fremont, Woodville, Lemoyne, Stony Ridge, Toledo, Java, Swanton, Del-ta, Wausean, Archbald, Stryker, Bryan, Edgerton, Butler, Waterloo, Kendalville, Brimfield, Wanaka, Ligonier, Millersburg, Goshen, Elkart, Osceola, Mishawaka, South Bend, New Carlisle, La Porte, West-

ville, Valparaiso, Wheeler, Hobart, High-lands, Hessville, Hammond and Chicago.

The Chicago-Davenport stretch lies through Lombard, West Chicago, Geneva DeKalb, Creston, Rochelle, Ashton, Frank-lin Grove, Dixon, Sterling, Galt, Lydon, Denrock, Erie, Hillsdale, Watertown, East Moline, Moline, and Davenport. The road through Iowa was outlined in the first paragraph.

For the above tour, you will be restrict-ed to 60 days in Illinois, 10 days in Penn-sylvania, two periods of 7 consecutive days in Virginia and in Maryland you will be obliged to secure a 7-day permit tag from the commissioner of motor vehicles. In the other states you will need nothing more than your state license.

A book which covers the entire trip is the Blue Book, volume 3 and 4, and offers you many other roads from which to choose.

AUBURN, IND., TO CAPITOL

Auburn, Ind.—Editor Motor Age—Will Motor Age please publish in the next issue the best motor car road from Auburn, Ind., to Washington, D. C., as I am contemplating such a trip this summer.—H. C. McClung.

Go to Waterloo, Butler, Edgerton, Bryan, Ridgeville, Napoleon, Tontogany, Bowling Green, Scotch Ridge, Pemberville, Wood-ville, Fremont, Clyde, Bellevue, Monroe-ville, Norwalk, Townsend, Wakeman, Kip-ton, Oberlin, Elyria, Ridgeville, Cleveland. An excellent option to the above in nice weather would be to motor from Clyde to

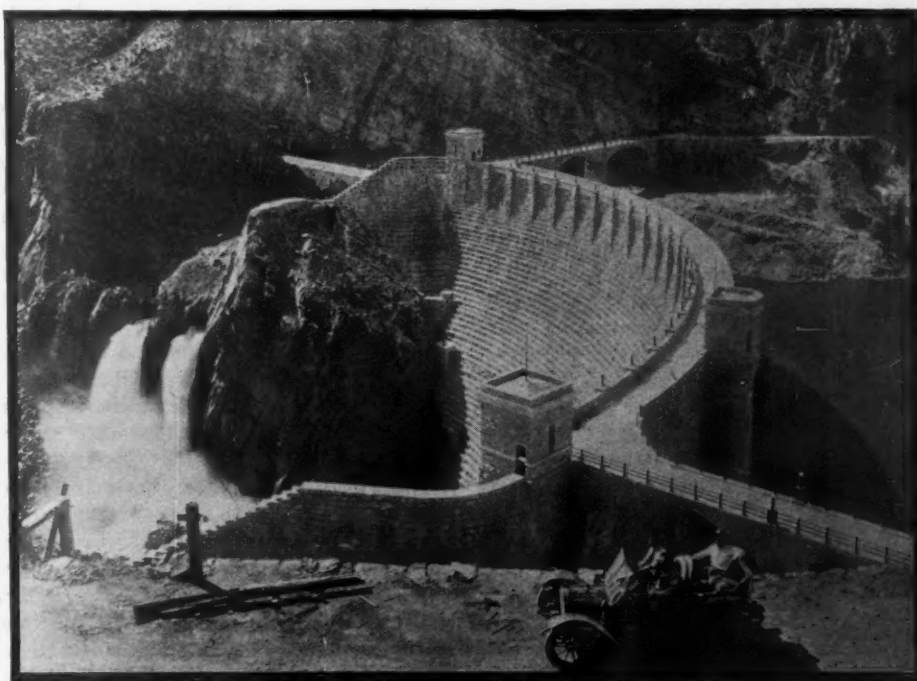
Castalia, Sandusky, Huron, Ceylon Junc-tion, Vermillion, Lorain, Rocky River via-duct, Cleveland. Headed for Pittsburgh pass through Randall, Chagrin Falls, Au-burn Center, Troy, Parkman, Southington, Warren, Girard, Youngstown, Poland, New Middletown, Petersburg, Enon Valley, Darlington, Beaver Falls, New Brighton, Rochester, Freedom, Economy, Sewickley, Pittsburgh. As stated by the Blue book Cleveland to Pittsburgh is a hilly trip and the roads are variable, mostly dirt with considerable clay.

Pittsburgh to Washington, D. C., is by way of Castle Shannon, Finleyville, Ginger Hill, Beallsville, Centerville, Brownsville, Haddonfield, Uniontown, Hopwood, Farm-ington, Somersfield, Addison, Oakton, Grantsville, Frostburg, Cumberland, Han-cock, Indian Springs, Clear Spring, Hagers-town, Funkstown, Benevola, Boonsboro, Braddock, Frederick, Hyattstown, Clarks-burg, Gaithersburg, Rockville, Bethesda, Dupont Circle, Farragut square, Washing-ton, D. C.

WANTS OKLAHOMA ROUTE

Sulphur, Okla.—Editor Motor Age—Through the Routes and Touring depart-ment will Motor Age tell me what is the best motor car route from Hastings, Neb. to Sulphur, Okla.?—E. J. Clover.

Follow the Overland trail to Minden, thence travel south to Franklin, Riems-ville, Smith Center, Portis, Downs, Beloit, Victor, Sylvan, Wilson, Glafkin, Ellin-wood, Chase, Lyons, Sterling, Nickerson, Hutchinson, Halstead, Newton, Wichita, Peck, Riverdale, Wellington and Cald-well. The Oklahoma towns are Renfrow, Medford, Pondereek, Kremlin, Enid, Wau-komis, Bison, Hennessey, Dover, King-fisher, El Reno, Yukon, Oklahoma City, Norman, Purcell, Wayne, Paoli, Paus Valley, Wynnewood and Sulphur.



ROOSEVELT DAM, ARIZ., WHICH IRRIGATES 240,000 ACRES OF DESERT LAND

Heavy-Car Advocate

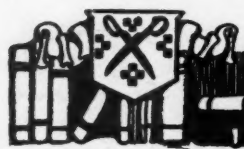
Dixie, Wash., Comes Back at Pratt, Kans., on the Car Weight Argument

DIXIE, Wash.—Editor Motor Age—I was greatly surprised when I found J. W. Farmer's answer in the Readers' Clearing House in issue of February 22 in regard to light and heavy cars. First he brings up the motor cycle and says that it will go 70 and 80 miles per hour, and compares it with the motor car for strength, but our record speed for the motor car is nearly double that speed, or a little more than 140 miles per hour. So the motor cycle is not in it for speed, but we should compare the care for dependability, which is worth more to us than extreme speeds and I think we all know that the motor cycle would not endure it to strike the bumps and ditches that the motor car must stand. He also brings up the tire proposition and says that the heavy car will use \$4 worth of tires while the light car uses \$1 worth. Now, if my car weighed just twice as much as his it would use twice as many tires if they simply wore out, but if either tire gets a cut so that water can get to the fabric it will blow out as soon as the fabric rots enough, and anyone should know that the one tire will rot as quickly as another. Therefore, I think that the heavy car will not use quite as many tires as the light one, accordingly.

Furthermore, my tires have carried the heavy car about 4,500 miles and I have not bought any new tires yet. Surely Mr. Farmer's car will not run a set of tires four times that distance. I personally know of a car that weighs 1,000 pounds less than mine and it uses more tires than mine does. I think that too much power and not enough weight will wear out more tires than the same power with enough weight to give it better traction so that the wheels will not skid and spin so much.

Upkeep is generally spoken of not including tires, and we all know that it takes weight in order to get strength. As for control, my car steers as easily as any car that runs on the road, and if I don't happen to see a ditch until I hit it, the car just jumps a little and goes on with the steering parts and axles uninjured, while with the lightweight something will often break and perhaps cause an accident. I have seen several cars hauled in, in every case because the parts were too weak or, in other words, too light. I think all readers will agree to this.

Any car will break from careless using, but I never have been able to break mine yet and it has even torn down fences and gone through ditches at a speed that light cars positively would not stand. I was surprised at the weight when my car was put on the scales, but today I am glad



The Readers'

Question of Weight to the Fore Again—Ignition Engine Starters Held Not Harmful—Books on Body Painting Wanted—Valve-Setting on Offset Cylinders



I have a heavy car. I have observed many cars that have seen no more service than mine in the shops to have many troubles remedied. Besides, they often squeak in many parts of the frame while my car rolls along as smoothly as ever, and has no poorly fitted doors as are often seen on light cars. My heavy car does not rattle or vibrate but glides along at any speed, almost noiseless. It is economical in the use of gas and tires, and as for other troubles I can say I have had none.

I will ask Mr. Farmer to take any motor car catalog he can find, and in it he

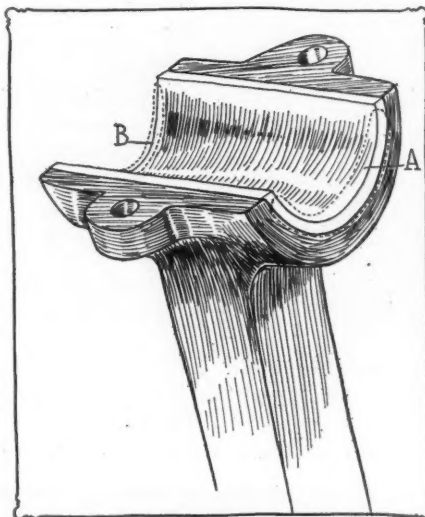


FIG. 1—EASY REPAIR FOR LOOSE CONNECTING ROD

will surely find where many parts are made heavier to provide the required strength. And as for accidents I have never heard of one caused by inability to control the car unless some part was broken that made it uncontrollable, or, in other words, too light. He also says that the largest repair bill he ever paid was on a heavy car and was due to carelessness. Surely this bill would have been more had it been a light-weight car.

The reason nearly all manufacturers catalog their cars lighter than they really are I do not know, but that does not settle the question. I think the makers do know, and that is the reason they build the cars heavier each year, but to satisfy the public I suppose is the reason they catalog their cars lighter than they really are. Therefore, I will stand up for the heavy car until something better has been invented and that invention is not in sight. —Paul Tonney.

Acetylene Starters Safe

No Records of Harmful Effects of Gas on Cylinders of Self-Cranking Motors

INDIANAPOLIS, Ind.—Editor Motor Age—Please advise me through the Readers' Clearing House what effect acetylene gas has on the cylinders of a motor car. Does this gas have a harmful effect when used through a self-starter?—Lloyd C. Thomas.

Motor Age has no record of any harmful effect of acetylene gas on the cylinders of a motor car when employed with the self-starters now in use; except for an excessive carbon deposit if too rich a mixture is used. Some theories were advanced that acetylene had a damaging effect on the cylinders and pistons of an engine. It is claimed, however, that these ideas were brought out by the fact that engines using acetylene has all the carbon deposits cut out of them. It is said to be true that engines using acetylene starters are generally free from carbon and soot, but this is not due to any effect produced by acetylene. It is due entirely to the cleansing effect of the acetone in which the acetylene is stored, a portion of which is carried over into the cylinders by the acetylene. Acetone has the property of cutting or dissolving the gummy and oily products which hold the small pieces of carbon together, thus loosening and breaking up the carbon deposits. A properly designed acetylene starter for these reasons cleans the motor of all carbon deposits. But if it is not designed correctly it will increase the carbon deposits in the engine by the production of more carbon and soot through imperfect combustion, due to too great a quantity of acetylene. The strongest explosion is obtained with mixtures of from 12 to 15 per cent of acetylene.

NO BOOK ON BODY PAINTING

Jackson Center, O.—Editor Motor Age—Kindly advise me if there is a thoroughly reliable book treating on motor car painting, one that if followed will give a No. 1 job on iron or wood. Where can I get the best paints for motor car use?—C. B.

Motor Age has no record of any thoroughly reliable work treating on the subject of motor car painting, and would be glad to hear from any reader having knowledge of such a book.

Clearing House

Electric Current from Ford Magneto as Supply for Headlights
—Sizes of Bulbs Required—Figuring Pressure in Combustion Chamber—Advice for Would-Be Truck Driver

Lighting on Ford Magneto

North Dakota Reader Describes System for Electric Lighting on Car—Rod Repair

LEONARD, N. D.—Editor Motor Age—
In answer to Subscriber, Gary, N. D., regarding the pound he mentions in his model T Ford, I will say that I have spent a good deal of time with this particular annoyance and have come to the conclusion that it is not a pound at all, but is more in the nature of a rattle, and most frequently manifests itself when the gas is suddenly shut off when running at good speed, and as soon as the gas is turned on it stops. If it was caused by loose shaft bearings it would make no difference whether the gas was on or off. I find that it is caused by side shaking in the connecting rods and is worse in the old-style pistons than in the new. In the old-style piston there is no bushing for the piston pin, simply running in the bare cast-iron hole. The pistons now have brass bushings for the pin to run in.

There is a better way to do away with the side shaking than the one given by Motor Age when it says to have them re-bushed. There is not one shop in a hundred that could rebush a connecting rod and have it any better than before. To eliminate the side play, take out the rod and remove the cap and build up the corners of the babbitt with ordinary tinner's solder as shown in Fig. 1 at A and B. Put on plenty and file it to a general shape and then clamp it tightly to its bearing on the shaft to press it into contact. This method is extremely simple and cheap and as there is very little side wear one is surprised at the durability. It is cheaper to buy new connecting rods than to try to rebabbitt old ones and fit them, as new ones can be bought for \$2.50 each. Regarding the Buick trouble mentioned in the same communication, I would suggest that perhaps the valve cages are not fitting tight at their base and will cause erratic firing at slow speed and will seem to fire all right at higher speed as noticed.

There is a good deal of talk of electric lighting on the Ford and as I have equipped a number of cars with lighting systems thought a word might be appreciated. Like everything else, to get satisfaction you must use intelligence. I find that the magnetos vary some in dif-

ferent cars so that the proper bulb will have to be determined by experiment. I find that most cars take two 6-volt 2-ampere Mazda tungsten bulbs connected in series between ground and switch—the connections are shown in Fig. 2 in answer to another communication—the most important parts of the whole system are the reflectors and should be perfectly true parabolas. Most of the reflectors on the market are very inaccurate and I always recommend buying some good make of complete lamp. It seems better to use the 6-volt bulbs in series than 12 or 14-volt in parallel, as the sixes are much easier to buy in all sizes and the filaments

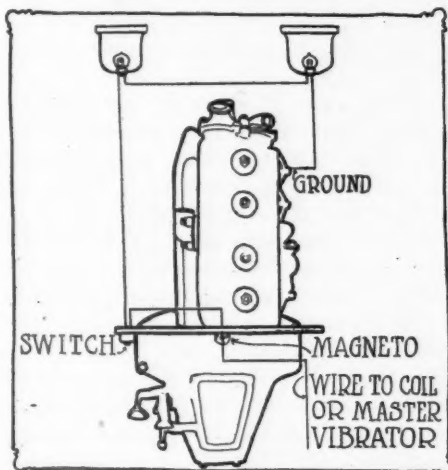


FIG. 2. LIGHTING HEADLIGHTS FROM FORD MAGNETO

are thicker and more durable. The lamps can be burned and the engine fired at the same time and the strength of the current will not show whether the lamps are on or off except at extremely slow speed, if the coils are properly adjusted. Of course the coils can be made to draw practically all of the current, with a consequent burning of the platinum points. I can say in closing that any one who has not used a master vibrator does not know what there is in the car, and would advise all to try this device.

I would like to say a word about the timer. The old Ford timer rides on the end of the camshaft, never gets oiled and always wobbles so much that accurate firing is impossible. The 1912 timer is so made that it cannot wobble, can be slipped off the motor with the finger for cleaning and inspection, and the cylinder oil has to be poured in through it so it is always oiled. The whole thing can be had new for \$2.75.—A. L. Porter.

Calculating Compression

Formula for Determining Compression Pressure in Cylinder Worked Out for Inquirer

LAFFAYETTE, Ind.—Editor Motor Age—Through the Readers' Clearing House will Motor Age enlighten me in regard to:

1—A formula for determining the compression when the cubic inches in the combustion chamber are known?

2—The thickness of the average cylinder wall, water jacket space, and jacket wall.

3—The area of the intake and exhaust valve opening in comparison with the area of the cylinder in the Knight motor.

4—The average thickness of the top wall of the combustion chamber.

5—The area of the valve opening obtained with the CID rotary valve, and opening and closing in degrees.

6—Can copies of patents issued be obtained from the patent office? If so, please give a list of the patents issued for rotary valve motors in the United States.—E. A. Martens.

1—The compression pressure in pounds per square inch absolute can be found by applying a modification of the equation for the adiabatic compression of air, that is the compression of air without giving out or receiving heat, thus:

$$P_2 = P_1 \left(\frac{V_1}{V_2} \right)^{1.4}$$

in which P_2 is the desired value for the compression pressure, P_1 is the initial pressure in pounds per square inches absolute before the beginning of compression, V_1 is the total cylinder volume with the piston at its outer center position, and V_2 is the volume of the combustion chamber with the piston at its inner center position. In engine practice the exponent 1.4 is slightly diminished due to the modification of the ratio of specific heats of the air in the mixture caused by the introduction of the fuel. Also, a certain amount of leakage and heat loss must be accounted for through a like further diminution of its value. A value of .126 will give very approximately correct results for engines in good working order with valves and pistons tight and walls free from carbon. Again, since there always are aspiration losses, the initial pressure at the commencement of compression will be somewhat lower than atmospheric. In the average engine this aspiration loss is about 1 pound per square inch at that engine speed at which the highest compression pressure is obtained. Therefore, the pressure at the beginning of the compression stroke is 13.7 pounds per square inch absolute. Substituting, the equation becomes modified to:

$$P_2 = 13.7 \left(\frac{V_1}{V_2} \right)^{1.26}$$

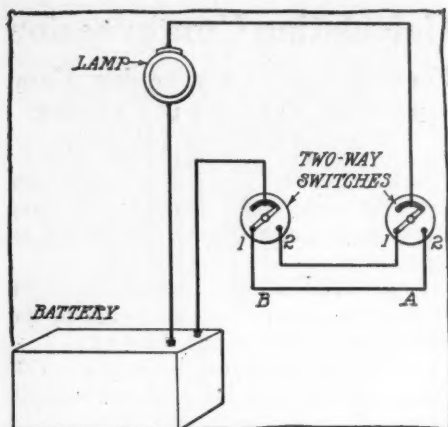


FIG. 3. CONNECTIONS FOR DOME LIGHT CONTROLLED AT TWO POINTS

Thus, taking for example a one-cylinder motor with a 4-inch bore and 5½-inch stroke. The volume of the piston sweep is 69.1 cubic inches. Supposing that the volume of the combustion chamber is 20 cubic inches, V_1 and V_2 in the equation now become 89.1 and 20, respectively; and with these values the equation reads:

$$P_2 = 13.7 \left(\frac{89.1}{20} \right)^{1.26}$$

and solving we have $P_2 = 90.7$ pounds per square inch absolute as the result. Subtracting atmospheric pressure, 14.7 pounds per square inch, from this we have a compression pressure of 76 pounds per square inch gauge.

2—The walls of the cylinders should never be cast less than ¼ inch thick, although the required thickness can be found from the following formulae:

$$P \times D = 2t f; \text{ or } t = \frac{P \times D}{2 \times f}$$

where P = the maximum pressure due to explosion in pounds per square inch. D = the diameter of the cylinder in inches; t the thickness of the cylinder wall in inches; f = a safe working stress for cast iron—say, 2,500 pounds per square inch.

The water-jacket space should never be less than ¼ inch, and the average space in motor car engines is about ½ inch. The metal of the water-jacket should be as thin as possible, the minimum thickness which can be cast safely being about 3-16 inch.

3—The Stearns-Knight motor has cylinders with 4¼-inch bore and 5½-inch stroke, and for this size engine, the intake port is ½-inch deep and extends 124 degrees around the sleeve, this being slightly more than one-third of the circumference. This practically is equal to a rectangle 4.5 inches long and ½ inch wide. The exhaust port is a little larger, being ⅝ inch high and the same circular length as the intake.

4—The average thickness of the top wall of the combustion chamber is the same as that of the side walls, about ¼ inch.

5—Motor Age has no data regarding the valve opening of the CID Motor.

6—Yes. Copies of patents issued can be obtained at a cost of 5 cents per copy. Motor Age would advise that you communicate with the Commissioner of Patents, Patent Office, Washington, D. C. regarding the list of patents issued for rotary valve motors.

SHIPPING CAR BY FREIGHT

Elgin, Ill.—Editor Motor Age—Will Motor Age kindly answer—or to show by illustration might be better—the best way of blocking a motor car in a freight car. We wish to keep tires on ready for use when unloaded.—A Reader.

The Santa Fe railroad issues a little booklet entitled "Suggestions for Loading Automobiles to Avoid Damage in Transportation," which will give you just the information you desire; the pamphlet is thoroughly illustrated, one of the illustrations being reproduced in Fig. —.

In packing the car, empty the gasoline and water tanks and disconnect the batteries. If electric cars, remove batteries. Place the vehicle in the car parallel with the sides of the car; and see that the front wheels are in line with the back wheels. Wrap the lower third of the tires with burlap to prevent chafing; and set the brakes.

Fasten each wheel to the floor with a strong band of canvas or several layers of burlap of the width between two spokes. Secure the band to the floor on each side of the wheel with blocks 2 by 4 by 12 inches. Place these blocks parallel with the wheel, using plenty of nails or spikes so that the band cannot pull loose.

Use blocking in front and behind each tire one-third as high as the diameter of the wheel, and at least 1 inch wider than the tire. Fasten this securely to the floor and tie together with 1 or 2-inch lumber from block to block. Have the blocking of sufficient width so that the boards used to tie the blocks together will clear the tire at least ½ inch on each side of the tire.

The tires should be tightly inflated; and the edges of the boards and blocks next to the tire should be rounded or beveled, so that if the tire should become deflated or in any way come in contact with the boards or blocking, it will not be so liable to chafe. Place covering over the vehicle to keep off dust. Also remove lamps to prevent damage to them.

Freight cars should be carefully inspected to see that they are fit for loading. If there are nails or other projections in the floor or sides of the car they should be removed. If the roof appears to be leaky, or its fastenings for doors, both end and side are not complete or ample, the car should be refused and a car suitable for loading demanded. Failure on the part of the shipper to do this renders him liable for the damage resulting from having loaded the vehicle in a car manifestly unfit.

Tire Specifications

Composition and Proportions of the Different Ingredients in Motor Car Treads

MANCHESTER, Ia.—Editor Motor Age

—I would like to know—and I believe others will be interested in the same line—what are so-called specifications as to material used in the standard motor tire. Take for instance a 34 by 4 tire.

1—What should be its weight finished?

2—What should be the weight and kind of cotton used?

3—Amount of pure rubber?

4—Amount of mixed?

One has tires offered with a difference of 3 to 6 pounds for the same size tire, which in part leads to these questions.—Charles J. Seeds.

1—Inasmuch as different tire makers have their own ideas as to how a tire should be made, and proportion their mixtures accordingly, one should not be surprised to find considerable difference in the weight of the various makes of tires. As for tires of the same style and make, there rarely is more than a pound difference in weight; in fact Motor Age has been unable to find more than ¾ pound difference in the weights of four tires 34 by 4-inch tires taken from the stock of several different tire salesrooms. Greater differences may be possible.

2—Imported Sea Island fabric generally is employed.

3—In a 41-pound batch of the best tire stock, about 15 pounds might be pure Para rubber.

4—The remainder of the mix would consist of say 8 pounds of lead, 7 pounds of zinc, 8½ pounds of litharge, and 1½ pounds of sulphur. The mixtures vary greatly with the conditions for which the finished product is intended.

In addition to the pure Para rubber, tire makers also use inferior grades, but as for amounts employed little can be learned. In order that the rubber used in tires may have certain qualities imparted to it, according to the purpose for which it is required, the other ingredients such as zinc oxide, Paris white, chalk, litharge, lamp black and antimony are added, and, in some special cases where high tensile strength is desired, a material known as Murac is incorporated in the mixture. Although, in many cases, the principal reason for compounding is the production of the finished article at a lower price, this is by no means the only reason, and the fact that cheap organic or inorganic matter is added to the rubber cannot, therefore, be considered as adulteration; such added substances may be absolutely necessary, especially in the rubber for motor car tires, in order that the material shall have the necessary resiliency, the tensile strength and the quality of endurance, which are demanded by the motor car user.

Cure of Motor Knock

Method of Locating Elusive Pound Noticed With Engine Running Idle

CHAMPAIGN, ILL.—Editor Motor Age—Through the Readers' Clearing House will Motor Age give me some information on the following? I have a 1911 Hupmobile which knocks when running idle or about 20 miles per hour. I have noticed when it is idle and running slowly it misses, but it does not miss when on the road. The valves have been ground and new spark plugs put in, and all connections on the intake pipe made air-tight. The knock is regular when running fast, but irregular when running slowly. Is the trouble with the magneto? I have noticed that one of the cylinders is not as strong as the others, that is, when the petcock is opened fire does not shoot out till the throttle is quickly opened. The knock seems worse just after the throttle is opened, or the power is shut off. Will Motor Age tell me what is the trouble?—J. V. Swearingen.

The knocking in your motor may be due to a loose center bearing of the crankshaft. To test for this, throttle down the motor so that it runs slowly and quietly, then open the petcocks of the two center cylinders and the knock, if due to a loose center bearing, will be more audible. The knocking also might be due to the miss-firing, which in turn may be caused by improper adjustment of one of the valve tappets. There should be space of at least the thickness of a business card between the end of the valve-stem and tappet when the valve is closed, otherwise when the motor gets warm and the stems become a trifle elongated from the heat, the valve may not seat tightly. Test the compression of each cylinder after the motor is warmed up, by cranking it over slowly by hand.

WOULD BE A TRUCK DRIVER

Springfield, Mo.—Editor Motor Age—I have read the articles in the last two issues of Motor Age on the subject of truck drivers, and would like to have the following questions answered, if possible:

1—What is the average salary of a driver of a truck of over 4 tons' capacity.

2—Is the driver required to assist in the loading and unloading of the truck?

3—How could a young man of 20 get into the salesroom of either commercial or pleasure cars, having had experience with the public in a retail way?

4—Give the names and addresses of the leading Chicago newspapers.

1—The average wages of truck drivers is around \$18 per week.

2—In most lines of truck work the driver is required to assist with the loading and unloading.

3—First build up a knowledge of the principles of salesmanship and of car operation and construction. The users' end

is more important than the manufacturers', especially in commercial vehicle work. When competent to make good apply for position. A successful motor car or truck salesman needs a broad fund of knowledge both of facts and human nature.

4—The Tribune, Record-Herald, Daily News, Evening Post, Examiner, American, Journal and Inter Ocean.

OPERATING DOME LIGHT

Chicago—Editor, Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—Kindly explain with diagrammatic illustration how it would be possible to connect two independent switches on one dome light in a limousine body, one switch inside and the other to be operated from the driver's seat.

2—From which point of a spark plug does the current jump with a Bosch magneto?

3—What advantage does the National car derive from constructing the pistons in such a way as to raise them above the lower level of the chamber?—P. A. D.

1—A diagram showing how two switches may be employed to operate a single dome light is shown in Fig. 3. The switch A represents the one conveniently located about the driver's seat, and B the one inside. These switches are of the two-way design; that is, it always is in contact either with contact point 1 or 2, there is no neutral point at which the switch can rest without making connection between the upper terminal and either one or the other of the contacts 1 or 2. Thus, if as indicated in the illustration, both switches are resting in contact with contact point 1, the lamp will be out as the circuit is not complete; but if one should climb into the car and turn switch B so that it will contact with point 2, the circuit will be completed and the lamp lit. Now if the switch A at the driver's seat were turned from contact 1 to point 2, the circuit would again be broken and the light extinguished; whilst to relight it one would have but to turn switch A back to contact 1, or switch B to contact 1.

2—The current does not jump in the same direction always, but probably oscillates back and forth, changing with the alternations of the primary current.

3—The chief advantages of the convexed piston head design as used on the National car motor, are increased strength in the head, and lighter construction.

DIES FOR REPAIRMAN

Buffalo, Minn.—Editor Motor Age—Inclosed please find a drawing, Fig. 4, for the Readers' Clearing House columns of Motor Age, representing substantially a Rambler motor with offset crankshaft.

1—I wish to know when the center marking on the flywheel comes under the pointer, in what position the throws of the crank are. If the center would be at

A when the crank throw is in line with the base, then the piston has not reached the top. If at B, neither the connecting rod nor crank throw is concentric with the base. If at C when connecting rod is concentric with the base, then the piston has receded.

2—What are the best screw plates to buy for motor car repair work? Are the Green River and Little Giant all right, and should the sizes be over or not? Should each die have its stock, or would that make it too expensive? Would a range of from $\frac{1}{8}$ inch to 1 inch be adequate, or should it be as small as $\frac{1}{16}$ inch and as large as $1\frac{1}{4}$ inch; and should they run in thirty-seconds or sixty-fourths. Should the taps be plugs or taper?

3—Some cars have S. A. E. threads. In a country shop would there be likely to be enough of such cars to warrant purchasing such a screw plate?

4—Are reamers made standard to fit assorted taper pins, or vice versa?

5—Is the new Hudson 33-horsepower by the S. A. E.? It would indicate that it was not.

6—When an H-shaped armature of a magneto is rotated, I understand that the magnetic lines of force travel through the core first in one direction and then in the opposite direction. Will Motor Age please tell me how this reverses the current in the primary circuit and why it is called alternating current?—P. G. Liederbach.

1—When the center marking on the flywheel of the Rambler motor comes under the pointer the piston is at the top of its stroke with the connecting rod and crankshaft in a straight line as shown at B in Fig. 4. In the positions A and C, the piston is not at dead center, just as you say. The valve-setting should be based on the piston at dead center, as at B.

2—So far as Motor Age knows, the screw plates mentioned are all right; it is not the policy of this paper to recommend one make above another. The dies for use in motor car repair work usually are adjustable with a single stock, and with adjustable dies the sizes generally employed in the repair shop range from $\frac{1}{4}$ inch to $\frac{7}{8}$ inch by sixteenths. It is well to get a full set, which has three taps of each size. This includes a bottoming or stub drill for drilling out studs,

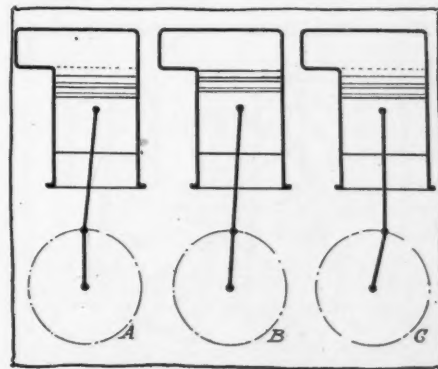
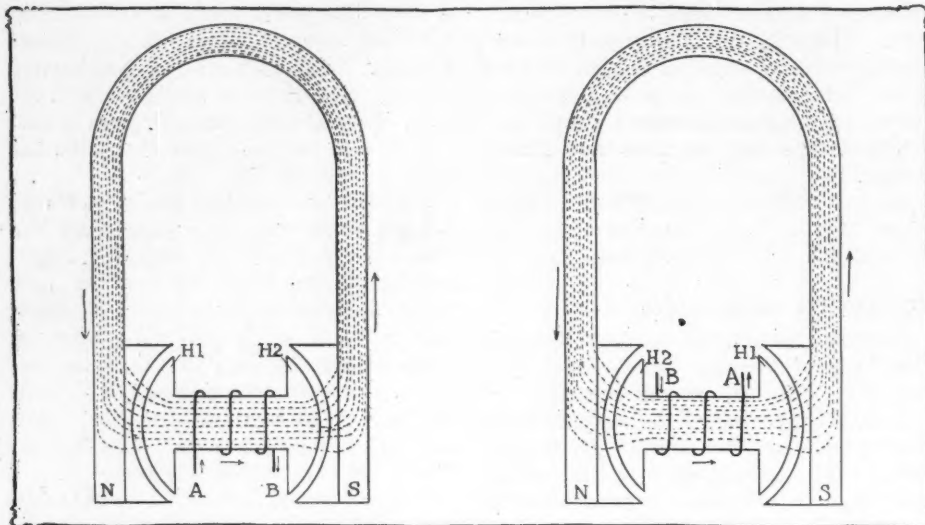


FIG. 4. B, CORRECT POSITION OF PISTON IN OFFSET CYLINDER FOR VALVE-SETTING



FIGS. 5 AND 6—ILLUSTRATING ALTERNATION OF CURRENT IN MAGNETO

At the left the end H1 of the armature is toward the N pole of the magnets and the lines of force are passing from N to S. Current generated in wire AB flows from A to B. At right armature has been rotated 180° so that H2 is next N pole and lines of force cut wire at B first. Current in wire flows from B to A or opposite to that in the first instance

a long taper for starting the thread, and a short taper for following.

3—Whether or not the S. A. E. dies will be needed will depend upon the cars in your locality, but these are threads being so widely used on the cars that in general repair work it is necessary to have a set of the S. A. E. and one of the United States standard dies. In some localities it is necessary to have dies for left-hand thread, for there are many cars upon which there are turnbuckles upon the brake rods, and if there are many in your locality it would be well to be prepared for them.

4—Reamers are made in standard sizes to fit the pins.

5—The Hudson is rated at 25.6 horsepower, according to the S. A. E. formula.

6—The lines of magnetic force pass through the magnets of a magneto always

in the same direction, making one pole the positive and the other the negative pole. That is, in the space occupied by the armature the lines of force always are passing in the same direction. But different sides of the wires on the armature core are presented to the lines of force as the wires are rotated from one pole to the other, so that the effect is the same on each wire as if it was stationary and the direction of the lines of force were changed. Now, the direction of the current generated in the wire depends upon the direction in which the lines of force pass through the wire, so that since you have done the same thing as reverse the lines of force when you rotate the wire from one pole to the other, the direction of the current in the wire is reversed, giving an alternating current. This is further shown in Figs. 5 and 6.

STATUS OF UNIT POWER PLANT

Audubon, Ia.—Editor Motor Age—Please advise through the Readers' Clearing House of Motor Age the following:

1—What percentage of cars uses the unit power plant?

2—What are some of the advantages and disadvantages of it?—Reader.

1—A canvass of the chassis models of pleasure cars for 1912 as listed in the tables of chassis specifications in Motor Age January 4 shows that 23.6 per cent has unit power plant. Similarly, from the table of specifications of commercial cars in Motor Age for January 11, it is found that 20 per cent of the truck models is equipped with unit power plant.

2—The chief advantages claimed for the unit power plant include the saving in weight, the less length, the possibility of using straight-line drive with the elimination of one universal joint and a slightly lower cost. The chief disadvantages urged against the unit power plant are the less accessibility of clutch and gearset in some types, and unequal distribution of weight.

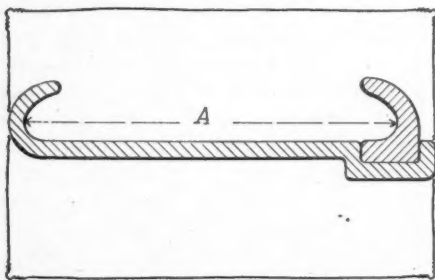


FIG. 7—STANDARD RIM MEASUREMENT

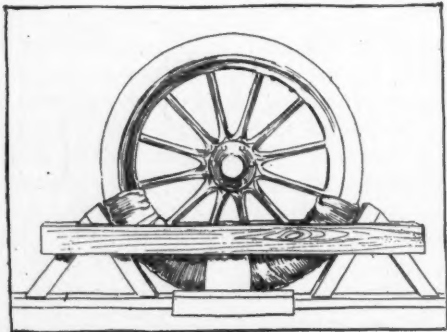


FIG. 8—METHOD OF BLOCKING WHEEL WHEN SHIPPING CAR

Series Plug Connection Suggested Arrangement of Spark Plugs for Multipoint Igni- tion Discussed

ROBERT LEE, Texas—Editor Motor Age—I note the reply December 7, 1911, to A Reader in Motor Age; also the reply to Farmers' Readers' Clearing House of issue of February 15, 1912, in regard to connecting up two spark plugs in series for dual ignition to be operated from one source of electric current. I think Motor Age will see this is an error from the explanation given below. To operate two plugs for one cylinder, there is no change to be made in any manner as regards the construction of the plugs or insulators. To connect them up, run the high-tension wire to one of the plugs and connect the wire that is now being grounded in almost if not all ignition systems to the other plug. The electric current then will pass from coil to first plug through the high-tension, then jump the gap from the insulated electrode to the point in contact with the cylinder wall, then through the cylinder wall of the second plug, from which point it will jump the gap to the insulated electrode of the second plug and return to source of current through the ground wire. I would be glad to have Motor Age show the above wiring diagram for a four-cylinder motor; also of the wiring as now being used on most four-cylinder dual ignition systems. I would be glad to have Motor Age express its opinion as to the merits of this system in illustration.—Charles E. Goss.

In Fig. 9 is a diagram of the Ideal dual system of spark plugs made by the Ideal Switch Co., Plainville, Conn., which accomplishes the same result in a somewhat different way. It would seem with your system, illustrated in Fig. 10, that this arrangement could not be employed where any part of the secondary, or high-tension circuit, is grounded, as is the case with high-tension magnetos or with battery or magneto systems, in which a single coil is used. In other words, to employ your system it would be necessary to have a separate coil for each cylinder and not have the coil grounded at one side of the secondary, as is usually the case, but to have both sides of the coil connected directly to the plugs.

The difficulty in requirement of extra voltage for two-spark plugs in series can be overcome by decreasing the length of the spark gap in each plug; that is, instead of having the sparking points $\frac{1}{8}$ -inch apart have them $\frac{1}{32}$ -inch apart. In which case you will have the same effective spark gap as with a single plug of $\frac{1}{8}$ -inch gap. Most magnetos when in good working order can supply current at a voltage sufficient to give two good sparks in series, and extra spark gaps are sometimes used, but unless this is allowed for in the design of the magneto misfiring may occur.

Special Touring Body

Oklahoma Reader Has Original Ideas on Arrangement of Car for Extended Trips

OKLAHOMA CITY, Okla.—Editor Motor Age—May I ask if there is a reliable motor car body manufacturer that makes over old or manufactures new bodies similar to the ones that have been mentioned and illustrated in Motor Age of late? I refer to the class that have reversible and removable front seats, rear seats folding back out of the way, or removable, thus making an open room for home convenience; also a table for dining, rear space over trunk rack arranged for two-hole gasoline stove and utensils, to be so arranged that cooking and eating may be done within the car, the canvas tops to be extended somewhat more than are in use at the present to allow for folding beds on each side of the room, the beds to be used as seats when not in use for sleeping; under beds outside of body to be canvas, to have wardrobe pockets, beds and wardrobe pockets to be removable, thus converting the car to an ordinary touring car for home purposes when not in use on tours where camping is required.

I think I am safe in saying that we all love to take summer and winter tours; in summer to the mountains and lakes, in winter to the sunny south and California. We like to be free from overcrowded and often inconvenient hotels and desire to be so equipped that we can stop at any place in the country that may please our fancy. It is a pleasure to be able to stop at some remote mountain trout stream, or some rustic lake, for a day or so, and not have to pitch tents, which are not always comfortable after they are up, but instead have nothing to do but drive the car to a desired place, stop there and have all home comforts. When camp is broken all that is necessary is to throw the canvas top back and enjoy the sunshine as one travels along. The camping outfit can be so stowed away and so arranged it would not be noticeable to any extent.

It would be appreciated by many present motor car owners if they could have the bodies of their motor cars worked over. It should not be expensive to remove the front seats and gasoline tank, replacing them with reversible and removable seats, remove the box from under the rear seat, making the seat to fold back or make it removable, and fit a new canvas top with wider overjets to allow for beds and wardrobes, the canvas top to extend over the trunk rack in the rear to allow for covering the cooking utensils and extension of folding beds. With the table board arrangement, the conveniences should be complete.—B. R. Harrington.

Such a body as you desire is, of course, a special order, and so far as Motor Age knows there is no firm making a specialty

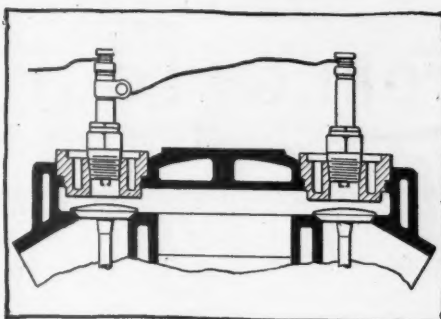


FIG. 9—IDEAL DUAL PLUGS

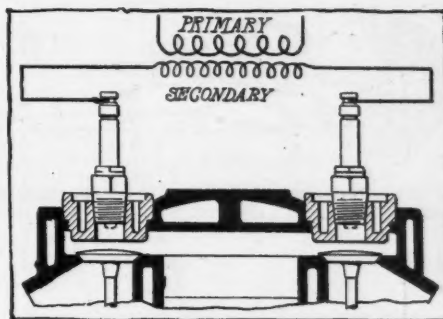


FIG. 10—GOSS' MULTIPPOINT SYSTEM

of these bodies. Almost any body-builder will undertake the construction of such a body according to your specifications, and will advise you as to whether it will pay to attempt to remodel your old body. Three Chicago firms to which you are referred, are the Chicago Coach and Carriage Co., Kimball Carriage Co., and Fred R. Meckel, 11 East Thirteenth street.

ELECTRIC LIGHTING FOR FORDS

Ellsworth, Ill.—Editor Motor Age—Please give instructions through the Readers' Clearing House for wiring a Ford model T for electric lights.—A Reader.

Electric lights may be supplied on the Ford from either the magneto or a storage battery. The wiring for magneto and two headlights is shown in Fig. 2. When a storage battery is used, headlights, sidelights and taillights can be wired as shown in Fig. 11. The first illustration shows the system. The Johnson Automobile Co., St. Louis, Mo., markets a complete outfit for Ford magneto lighting with parabolic reflectors for the lamps, as does the Vesta Accumulator Co., Chicago. The second illustration is the wiring of the Vesta battery system.

TIRE BEAD SIZE STANDARD

Richmond, Ind.—Editor Motor Age—Please answer through the Readers' Clearing House: Is the measurement of A in the accompanying sketch, Fig. 7, the same on all quick detachable clincher type rims made by different manufacturers for the same size tires? That is, is there a standard measurement for the point mentioned for various size tires?—E. R. D.

Yes; the measurement at A is standard for each size tire, so that clincher tires of various manufacturers are interchangeable on the rim. Also, the so-called over-size tires will fit it.

RACING QUESTIONS

New Haven, Conn.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—In Motor Age, issue September 21, 1911, there is an account of the races for the Dunlop trophy at Winnipeg. Was the Ford car which won the regular 3 3/4 by 4 model T?

2—What was the gearing or was it the regular ratio on stock models?

3—Was the track banked on the curves?

4—What are the cylinder dimensions of the Stoddard-Dayton-Knight six? In one

place I have seen them given as 4 1/2 by 6 1/2, and in another 4 1/2 by 5 1/2.

5—What is the gear ratio on direct drive of the Flanders 20?—Carroll B. Clark.

1—The Ford representatives at Winnipeg claim that the car that won the Dunlop trophy was a regular 3 3/4 by 4 model T.

2—The gear ratio of the car was 36 to 14, or 2 8/14 to 1.

3—The track was well banked on the curves. It is a full mile track and each stretch was 1/4 mile long, 1/3 being taken up in the curves.

4—The cylinder dimensions of the Stoddard-Dayton-Knight six are 4 1/2-inch bore, and 5 1/2-inch stroke.

5—The gear ratio of the Flanders 20 on direct drive is 4 to 1.

A POWER COMPARISON

Potsdam, N. Y.—Editor Motor Age—Kindly inform me, through the Readers' Clearing House, as to the amount of power developed by a motor with a 3 3/4-inch bore by a 4-inch stroke as compared with one having 3 1/4-inch bore by a 5-inch stroke. What is the rating?—Frank P. Mathews.

Motors are rated according to the S. A. E. horsepower formula, which does not directly consider the stroke. The rating is figured on the number of cylinders and the bore. A four-cylinder motor with 3 3/4-inch bore is rated at 22.5 horsepower, while a motor of the same number of cylinders whose bore is 3 1/4 inches is rated at 16.9 horsepower.

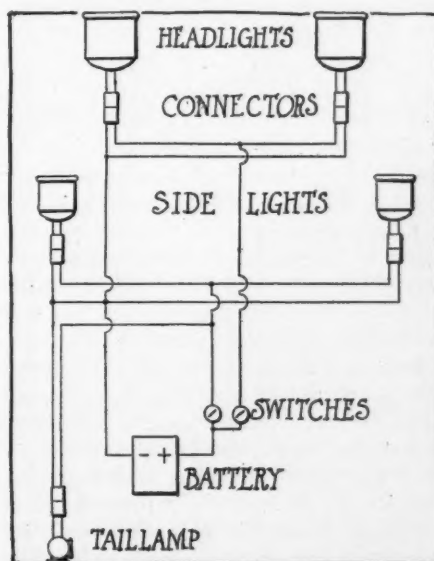
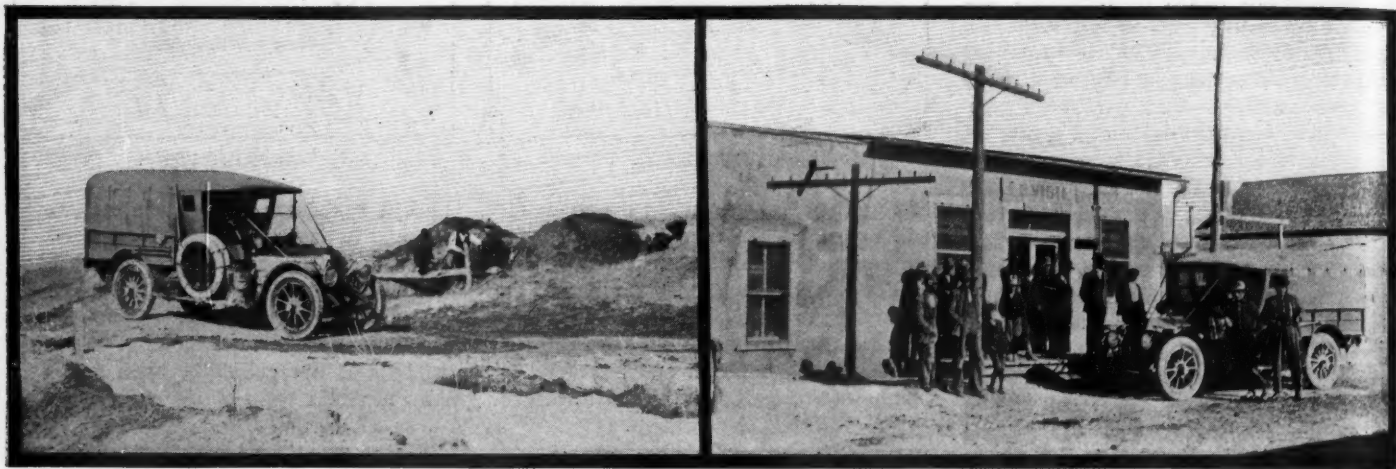


FIG. 11—CONNECTIONS FOR BATTERY LIGHTING

From the Four Winds



WESTERN TOUR OF HENRY B. JOY IN PACKARD SIX CAMP CAR—SCENES IN NEW MEXICO AND ARIZONA

CADILLAC Beats Velie—A 50-mile match race was run at the fair grounds track in Shreveport, La., March 2, between Carl Jones in a Cadillac and Guy Cox in a Velie, the former winning in 1:00:40. Cox's time was 1:01:47%.

Peoria Organizes Club—The Peoria Automobile Club of Peoria, Ill., has been organized. E. J. Case has been chosen president and Willis Evans secretary. One hundred applications were received for membership on the day of organization.

Show Arouses Buyers—The New Orleans press estimates that as a direct result of the motor show, held 2 weeks ago, no fewer than 200 new cars will be seen on the streets of that city this year. This is not including the number of out-of-town sales made during the show.

Decatur Club Election—At the annual meeting of the Decatur Automobile Club of Decatur, Ill., the following officers were elected: President, William McGinley; first vice-president, E. B. Coombs; second vice-president, Harry Leon; secretary, C. A. Wamsley; treasurer, J. M. Brownback. There are now 600 cars in Macon county.

Abolishing Another Toll Road—At the first annual banquet of the York Motor Club of York, Pa., President Paul J. Gilbert announced that the club officials had taken up the matter of abolishing tolls on the bridge from Columbia to Wrightsville with the Pennsylvania Railroad Co., and a favorable answer is expected.

Paraguay Removes Bus Duty—Congress has passed a bill admitting motor omnibuses free of duty. The only restriction is that they must enter the country during the present year and must have a seating capacity for at least eight persons. This concession is made in connection with the agreement recently made with an English company for a regular service through certain streets of the city not reached by

street cars and for a service with several of the suburban towns. Regular service will be maintained between Ascension and Fray Bentos, Mercedes and Dolores. In addition to serving these towns important rural districts will be served.

New Orleans Buying Electrics—New Orleans dealers are surprised at the increase in the demand for electric cars. During the 2 months of 1912 that have passed more electrics have been sold than during the entire year of 1911, it is said. One firm reports the sale of forty electrics this year.

Denver to Have Club Organ—The Denver Motor Club has not had an official magazine for some months, but it will begin the publication of a large monthly magazine about the first of April. The former organ of the club was the Toot-Toot. A name for the new paper has not yet been chosen.

Milwaukee Ready for Summer—The city street department of Milwaukee, Wis., has purchased four street-flushing machines, making a battery of eight machines, which will keep the asphalt-paved streets of the city clean during the summer. The department has purchased 700,000 gallons of asphaltum oil for macadam road preservation and dust-prevention, as compared with 500,000 gallons used in 1911. It has been found unnecessary to treat the streets oiled last year until the spring of 1913.

Armored Car for Mexico—An armored motor car has just been shipped to Mexico from New Orleans. The car, purchased from a dealer in second-hand machines, is fitted with light steel plates which are inclined at a slight angle, which protect the car and occupants from rifle fire. The purchaser is the war department of the Mexican government and it is stated that it is to be used in carrying funds between Mexico City and Cuerna-

vaca for the payment of the garrison in the latter place. Intermediate territory is infected with bandits and the armored car is expected to transfer the pay roll without the necessity of sending a large force of soldiers.

Better Streets Needed—Motor vehicles are handling 5 per cent of the freight from the docks at New Orleans, La., according to figures compiled by the port commission. It is pointed out that this figure would be increased greatly if better paving was provided on the streets along the water front.

Will Drive First Post May 4—Arrangements have been made to plant the first post of the Canadian highway at Alberni, B. C., Saturday, May 4. The driving of this post will be an interesting ceremony, the mallet being wielded by the lieutenant-governor. An executive meeting of the Canadian Highway Association will be held in Alberni on the same day and also a good roads banquet.

Election on the Coast—The annual meeting and election of the board of directors of the Automobile Club of Southern California has been held. The following directors have been elected to serve for the ensuing year: Fred L. Baker, A. C. Balch, A. M. Goodhue, W. L. Valentine, Charles Weir, Henry W. Keller, E. T. Off, E. G. Euster, H. G. Miller.

Aroused by Tax Bill—The London and Western Motor Club has been organized in London, Ont., to protect the interests of motorists in Ontario by promoting any reasonable good roads movements and to oppose all adverse legislation, particularly a bill which is now before the legislature to tax cars according to horsepower. The officers of the new association are: Honorary presidents, John McClary, C. B. Hyman and Adam Beck; president, John M. Moore; vice-presidents, Dr. John Wish-

art, George H. Belton, Dr. Kingsmill, Alderman William E. Robinson; secretary, John A. Croden.

Cortland Has Active Club—Cortland, N. Y., is proud of a motor club which is the fifth largest in the state, despite the fact that the county, which has the same name as the city, is one of the smallest counties in the state, having a population of only 17,000. The Cortland club has a membership of 263 as compared with 175 a year ago. Club officers say there will be at least fifty new cars in Cortland this month, mostly medium-priced machines.

Packard Officials on Tour—A 6 weeks' battle with snow, mud and sand in the wilds of New Mexico and Arizona was experienced by Henry B. Joy, president of the Packard Motor Car Co., who has just returned to his home in Detroit. The trip was made with a standard six chassis, carrying a special camp body and equipment. Leaving Denver late in January, Mr. Joy drove over the famous Raton pass to El Paso, thence to the Roosevelt dam and the Grand canyon, ending the tour at Yuma.

Cincinnati Club Election—Dr. C. L. Bonifield, president of the Ohio State Automobile Association, was re-elected president of the Cincinnati Automobile Club at the twelfth annual meeting. At the meeting it was shown that the Cincinnati Club has 1,200 members. Other new officers are: First vice-president, D. McKim Cooke; second vice-president, G. W. Drach; secretary, Dr. L. S. Colter; treasurer, Louis J. Merkel; consulting engineer, E. J. Carpenter; governors for 2-year term, A. P. Strietman, Carl F. Streit and B. F. Dulweber.

Canadians Want Faster Pace—A large and constantly increasing number of motor car owners in Ontario are making a determined effort to induce the provincial secretary to amend his new motor vehicles act so as to increase the speed limit in cities to 15 miles an hour, and to 25 or even 30 miles in the country. The advocates of this change argue that the Ontario farmers within a few miles of the larger centers where cars are numerous, have become so used to them on the country roads that the unreasonable objection to them is practically outgrown.

Maryland Discusses Roads—Improved highways for Maryland and good roads in individual counties throughout the state were topics of interest in the Maryland legislature last week. Senator Goslin introduced a bill calling for a state road bond issue of \$4,300,000. Of this sum it is proposed to have \$300,000 set aside for the construction of the proposed highway to Calvert, Charles and St. Marys counties, while \$40,000 is to be used on the old government post road from Perryville to Elkton. Delegate Taylor of Worcester county is preparing a bill providing for an appropriation of \$65,000 for the construction of 9 miles of road

from Berlin to the Delaware state line, there to connect with the Delaware state road. This would give a continuous line through to the Virginia line.

Jagersberger Would Race Again—Joe Jagersberger, who suffered the amputation of a leg, intends to stick to racing, it is said. A telegram from Jagersberger 3 days after the operation was pronounced successful says he has already placed an order for an artificial limb. He expects to drive in the Indianapolis race on May 30.

New York-Boston Record Lowered—Hughie Hughes, driving a Mercer, drove from New York to Boston in 7 hours 45 minutes. Hughes left Columbus circle at midnight Saturday, March 5, and arrived in Boston the next morning at 7:45. The distance by road between the two cities is about 260 miles, and the Mercer bettered the old record by 36 minutes.

Minnesota's Chauffeur Count—It is estimated by Secretary of State Julius Schmahl that there are nearly 2,000 chauffeurs in Minnesota. More than 700 have been examined this year and the board will finish its work before May 1. Mr. Schmahl says it costs about one-seventh of the sum collected to maintain the board. For 700 applications the income was \$2,100 and the expenses approximated \$300. The board members get \$5 a day and traveling expenses.

Canadian Road Project on—Preparations for the construction of the second of the proposed international highways from Montreal to Rouses' Point, that is, the one via Chambly, will be begun at once. The minister of agriculture has written to Mr. Desaulinere, M. L. A., to say that in consideration of the fact that all the municipalities on the route are ready to cart stone to the value of 25 per cent of the cost of a macadamized road and have

accepted the proposal of the government to pay the other 75 per cent, the government is ready to carry out its share of the bargain.

Mansfield Will Drag Streets—After pleading in vain for months with the city council to improve the streets of the city, the Auto and Driving Club of Mansfield, La., has taken matters into its own hands and is going over the unpaved streets with split log drags. It claims that with an expenditure of not to exceed \$5,000 it will be able to place nearly 100 miles of the city's streets in condition for motor cars during the greater part of the year.

Milwaukee Improving Boulevard—The Metropolitan Park Commission of Milwaukee county, Wis., has completed plans for a proposed unit of the parkway system in the city of Milwaukee. The unit is that which would include the Sixteenth street-Eleventh avenue viaduct and would cost \$4,000,000. The plans call for condemnation of one block on both sides of the two streets, making the streets 180 feet wide, placing a park area in the center, with double street car tracks on each side.

New Quaker Club—Another newcomer to the ranks of Philadelphia motoring organizations is the Belmont Motor Club. The club plans the promotion of a series of race meets, among which is included a revival of the twice-around-the-circle contest, an event that has not been held in Philadelphia or nearby for a number of years. The officers of the club are Frank D. Hall, president; first vice-president, William Boyle; second vice-president, James Stretch; secretary, F. C. Minford, and treasurer, Harvey Ringler.

France Collects Taxes—The 64,157 private cars in use in France during the year 1911 have enriched the treasury, by direct taxation, to the extent of \$1,339,129. All cars pay taxes according to seating capacity and horsepower, and the returns show that there are 14,092 cars with two seats and 50,065 with accommodation for more than two persons. The returns exclude taxicabs, manufacturers' test and demonstration models, motor cycles and all commercial vehicles, these being either free from taxation or taxed separately.

Third Show for Minneapolis—Minneapolis is to have its third motor car show this year, March 16-23, when there is to be a large display of electrical vehicles at the third annual northwestern electrical exposition at the Armory. Storage batteries will be displayed and other accessories of the electrical machines. A feature will be the demonstration by the General Electric Co., of a battery truck crane which will haul the exhibits of other companies from the parkway up the incline into the Armory and then distribute them over the exhibition floor. In addition all the concerns handling electric passenger cars in Minneapolis will be among the exhibitors, it is announced. Also there will be many ignition companies in.

Coming Motor Events

March 11-16—Show at Cedar Rapids, Ia.; M. P. Beck, manager.

March 12-16—Show at Syracuse, N. Y.; Syracuse Automobile Trade Association; Syracuse, N. Y.

March 12-16—Show at Denver; G. A. Wahlgreen, manager, Denver, Colo.

March 17—Track meet, San Jose, Cal.

March 13-20—Show of Boston Commercial Motor Vehicle Dealers' Association, Mechanics' building, Boston; C. I. Campbell, manager.

March 25-30—Tent show at Indianapolis, Ind.; Indianapolis Automobile Trade Association.

May 14-17—Commercial reliability run Chicago Motor Club, Chicago, Ill.

May 30—Indianapolis speedway, 500-mile race, Indianapolis, Ind.

May 30—Track meet, Salem, N. H.

June 20—Algonquin hill-climb, Chicago Motor Club, Algonquin, Ill.

August 8-10—Galveston beach meet, Galveston, Tex.

September 2—Speedway race, Indianapolis, Ind.

October 7-11—Chicago Motor Club reliability run, Chicago.

Standard Motor Constructions Continued

Atlas, Brennan, Buda, Church Pneumatic, Falls and Waukesha Engines for the Season of 1912 Described and Illustrated—Many Interesting Improvements To Be Found in the New Models—Inclosed Valves, Integral Casting of Manifolds and Special Truck Designs Are Among Year's Developments

IN THIS, the second part of a story descriptive of the designs and constructions of motors made by manufacturers who specialize in the production of power units for motor cars, the Atlas, Brennan, Buda, Falls, Church Pneumatic and Waukesha motors are covered. All of these, with the exception of the Church Pneumatic, are advanced types of the conventional poppet-valve design; while the Church motor is a radical departure, being a four-cylinder, two-cycle motor, having in unit with it a pneumatic clutch and transmission mechanism.

Three Falls Types.

Three types of four-cylinder motors, two of which may be incorporated in unit power plants, comprise the 1912 line of the Falls Machine Co., Sheboygan Falls, Wis. Of these motors two are L types, one, model B, with cylinders cast in pairs, and the other, model C, with cylinders in block; and the third, model D, is a T-type with cylinders, and inlet and exhaust gas manifolds all cast in one piece.

FALLS MOTOR LINE FOR 1912

Model	No. of Cyls.	Bore	Stroke	Valves
B.....	4	4 1/2	5	2 1/2
C.....	4	4 1/8	4 1/2	1 1/2
D.....	4	4	6	2 1/2

Though the Falls motors are made in three distinctive designs, they have several characteristics in common. Simplicity and accessibility are features of all of

By George Gaidzik

Part II

them; and all have inclosed adjustable valve mechanisms, helical or spiral engine gears, circulating splash oiling systems with gear pumps to maintain a constant level in the splash chambers. A large centrifugal water pump and adjustable belt driven fan are features of the cooling systems; and suitable brackets for the attachment of any standard type of magneto are cast integral with the aluminum crankcase.

The type B motor has a three-bearing crankshaft and camshaft; valves are of the bevel-seated type and operated by tappets of one-piece mushroom design; and cams are forged integral with the camshaft. Both the inlet and exhaust manifolds are one-piece constructions, and the inlet manifold is unusually short and compact. The crankcase is divided horizontally; the lower half being readily removable and containing a horizontal partition which separates the scoop compartments from the oil reservoir below. The upper half forms the base of the motor; has large substantial supporting legs cast integral with it; and the crankshaft bearings all are secured to it. The engine gears as in

all types are contained in an oil-tight compartment at the front of the crankcase.

Short, compact construction are the features of both the models C and D; but the C, L-head design has a two-bearing crankshaft, an inlet manifold cast integral with the cylinder casting, a one-piece exhaust manifold; and crankcase which, like the B, is divided horizontally.

The type D motor, which is shown in detail in Fig. 1, is unique in its symmetry and unity of construction. The T-type cylinders together with the exhaust and inlet gas manifolds are cast in one piece, and both the manifolds are thoroughly water-jacketed. A three-bearing crankshaft is employed, which is inserted from the rear into the barrel type crankcase employed.

Two Buda Models

For 30 years the Buda Co., Harvey, Ill., has been a prominent manufacturer of railway equipment and supplies. Three years ago it started to make motor car engines for the Chalmers and Hudson motor car companies according to their respective designs and specification. Now the Buda company is manufacturing engines and transmissions of its own design, which are being used by six American motor car manufacturers.

Two types of four-cylinder, four-cycle,

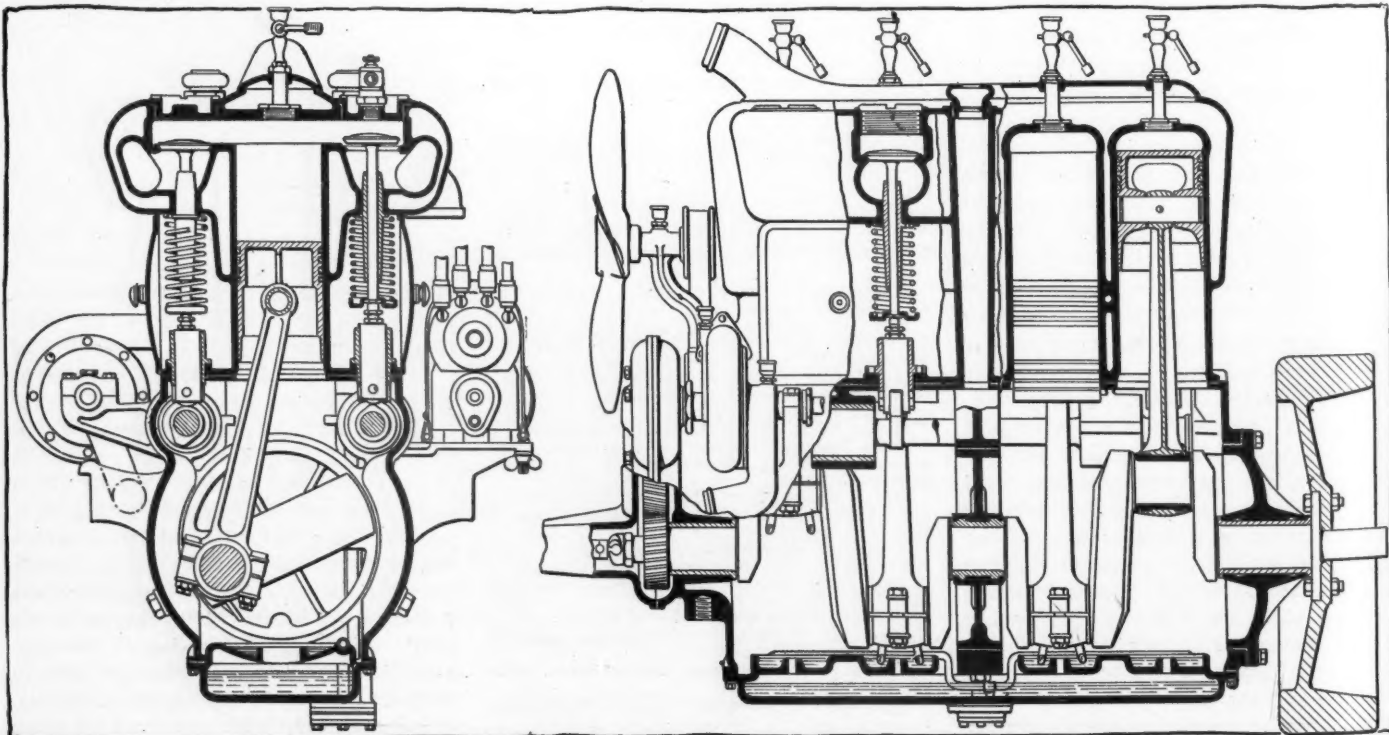


FIG. 1—END AND SIDE SECTIONS OF FALLS T-HEAD BLOCK MOTOR, MODEL D

water-cooled motors, designated models O and M, are made by the Buda Co. and a short study of the sectional drawings shown in Fig. 3 will serve to show that the product is not an experiment but an embodiment of features characteristic of the most advanced engineering practice, in which simplicity and accessibility predominate. Cylinders are cast en block, valves are inclosed, and a circulating oiling system is employed.

Difference of Buda Motors

Both motors are almost identical in design and construction. They differ, however, in that the model O has a three-bearing crankshaft, a bore and stroke of $4\frac{1}{8}$ and $5\frac{1}{2}$ inches, and an intake gas manifold cast integral with the cylinder casting; whilst the model M has a $3\frac{3}{4}$ -inch bore and $4\frac{1}{2}$ -inch stroke, a two-bearing crankshaft, and a separate Y-shaped gas inlet manifold.

The crankcase of Buda motors is made from an aluminum alloy, and is divided horizontally into halves, the upper half supporting the crankshaft and camshaft, and the lower portion containing the splash basins and oil reservoir of the circulating oiling system.

A heavy drop-forged crankshaft is used which is forged, heat treated and machined in the Buda plant and all bearing surfaces are ground to size. The rear end is provided with a flange to which the fly-wheel is bolted. Cylinders are made in the Buda foundry from a gray cast iron mixture and are accurately machined to a standard size so as to be interchangeable. Pistons are of cast iron ground to size and provided with oil grooves for lubrication of the cylinder walls. Each piston has four rings arranged above the piston pin; and the piston pins, which are hollow, are secured to the piston by a single stud. Con-

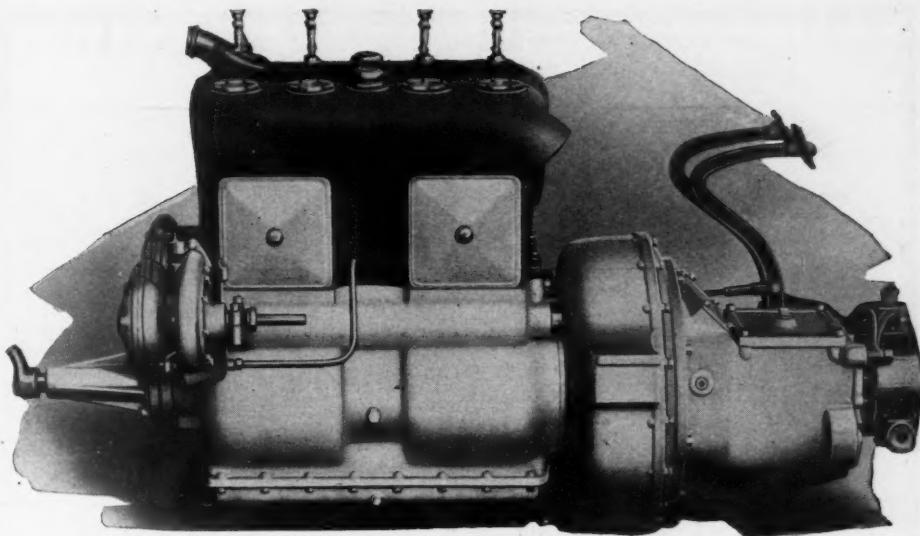


FIG. 2—FALLS UNIT POWER PLANT WITH T-HEAD BLOCK MOTOR

necting rods are drop forged and the upper ends are bushed with phosphor bronze, whilst the lower ends are fitted with adjustable die-cast bearings. All of the crankshaft bearings are bushed with babbit metal and the camshaft bearings are of phosphor bronze. An important feature of the camshaft bearings is their graduation in size, the one at the rear end of the motor being the smallest, the center one larger, and the one at the front end of the motor largest. This permits a convenient assembly or disassembly of the camshaft from the motor and provides a large durable bearing where most needed at the front end near the driving gear.

Beveled seated valves are employed which are made with nickel steel heads, electrically welded to soft steel stems. Pushrods are of the adjustable mushroom type; and all valve-operating mechanisms are inclosed so as to be protected from dirt

and dust, and to facilitate the lubrication.

All timing gears are cut helical and particular attention has been paid to the accurate maintenance of gear centers. The gears in the motor are of an unusually coarse pitch so that a generous bearing is obtained; and the set is comprised of one steel crankshaft gear, and cast iron camshaft, water-pump-shaft and idler gears. Flanges are provided to take care of end thrusts and end play, and all gears are easily accessible after the gear case cover has been removed.

Simplicity in Cooling System

In the cooling system the water pipes are extremely short and simple in construction, and are designed to connect to the radiator without bending the hose. The circulating pump is of the centrifugal type with bronze rotor and bronze bearings. Either of the two motor types, however, can be furnished in quantities ar-

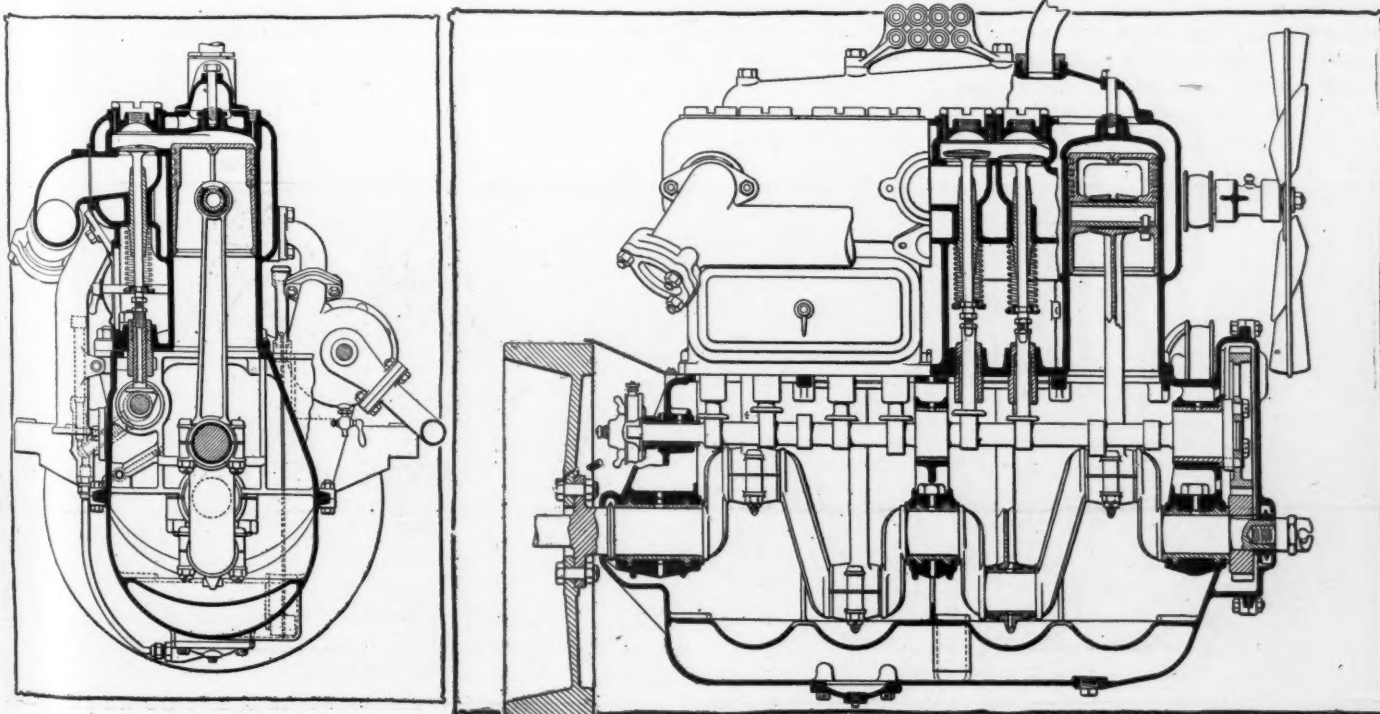


FIG. 3—END AND SIDE SECTIONS OF A BUDA L-HEAD BLOCK MOTOR, MODEL O

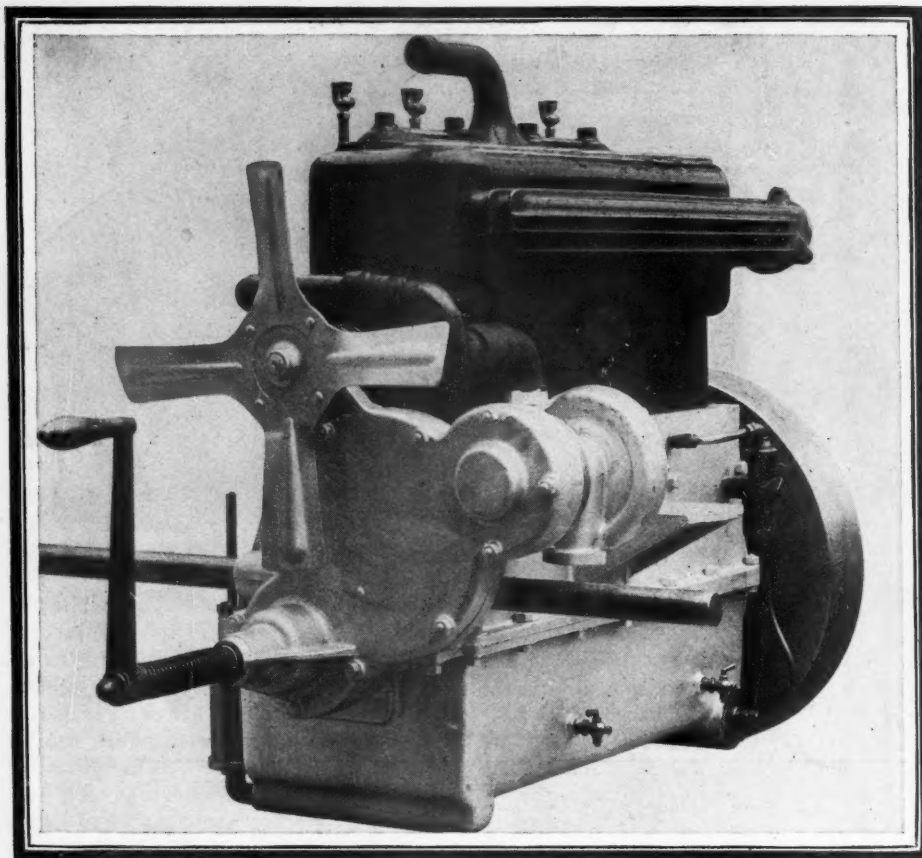


FIG. 4—A SHORT, COMPACT ATLAS MOTOR WITH INTEGRAL EXHAUST PIPE

ranged for thermo-syphon circulation. The fan is mounted on two sets of ball bearings.

Circulating Splash Lubrication

Lubrication of the motor, as previously stated, is by means of a circulating splash system, in which a small plunger pump which is driven by an eccentric cam on the camshaft, draws the oil from the reservoir at the bottom of the engine crankcase and forces it into troughs situated above the main bearings of the crankshaft. The overflow from these troughs, and that which passes down through the bearings, drains into the splash basins formed in a horizontal partition which separates the

splash compartments from the oil reservoir below. A certain level is maintained in these splash basins and there are scoops on the bottom of the connecting rods that dip into the oil and scoop it up for the lubrication of the big ends of the rods.

As for ignition, a magneto bracket is provided to which any of the popular types of magnetos may be attached; and the magneto is driven through an Oldham coupling by the same shaft which drives the pump. If desired, a commutator of the roller type can be attached to the end of the camshaft; but in case a commutator is not desired a neat aluminum cap is placed over the end of the shaft, which can be

removed at any time for subsequent attachment of a commutator.

Atlas & Knight Engines

The Atlas Engine Works, Indianapolis, Ind., manufactures three motor models for the motor car trade; these include two poppet valve models, and the sleeve-valve Knight engine. The two poppet valve models are almost identical in design and construction and embody many of the best features of modern engineering practice. These motors are of the four-cylinder, four-cycle L-type; they are simple and compact; a reasonably long stroke is employed; cylinders are cast in block; inlet and exhaust manifolds are cast integrally with the cylinders; valve mechanisms are inclosed; the crankcase is of aluminum, and contains a circulating oiling system; and provisions are made for three-point suspension direct from the main frame of a car. Most of these features are shown in Fig. 5.

Two Atlas Types

As for the points of difference between the two motors, the larger one has a 4¼-inch bore, 5½-inch stroke and 2-inch valves; it has a three-bearing crankshaft and five-bearing camshaft; its aluminum crankcase is divided horizontally and contains a combination force-feed and splash circulation oiling system; and mechanically forced water circulation is provided. The smaller motor has a bore and stroke of 3¼ and 5½ inches; it employs a two-bearing crankshaft and three-bearing camshaft; a barrel-type cast aluminum crankcase is used; the oil supply of the simple circulating system is contained in a pressed steel reservoir secured to the bottom of the crankcase; and cooling is by means of a thermo-syphon system.

Both motors are alike in that all valves are on the same side, and operated through adjustable pushrods from a single camshaft of large diameter. Cams are hardened and ground to size and shape, and are fastened to the shaft by keys and pins. Crankshafts are drop-forged and heat-treated, and supported in die cast bearings

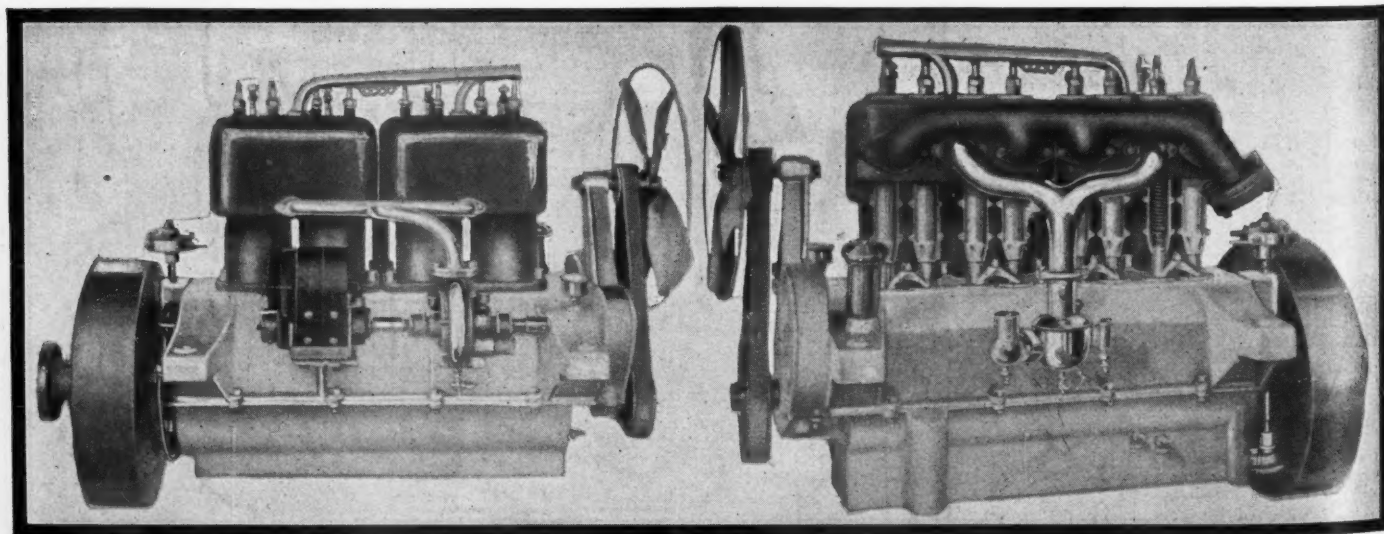


FIG. 5—RIGHT AND LEFT SIDE VIEWS OF NEW BRENNAN MOTOR

of liberal diameter and length. Connecting-rod bearings are die-cast bushings of Parsons white brass for the crank pins, and hardened steel bushings for the piston pins. Engine gears are of helical or spiral design to obtain smooth and quiet running.

Unique Lubrication System.

The lubrication system of the larger motor is unique in its design. The bottom of the crankcase acts as an oil basin. Narrow troughs are cast in below the connecting rods, and spoons are attached to the rods for scooping oil into the cylinders and connecting rod bearings. In the upper half of the crankcase an enclosed chamber is cast, running the full length of the case. This chamber is supplied with oil from a plunger pump operated by an eccentric on the camshaft.

In operation, the pump draws oil from the reservoir or basin at the base of the crankcase, and forces it into the chamber in the upper half of the case. Oil is thus kept under pressure in the oil chamber at the top of the case. Holes are provided at different points in the bottom of this chamber through which the oil is forced directly to the crankshaft, and camshaft bearings, and to the troughs under the connecting rods. The overflow from the bearings and troughs returns to the reservoir at the bottom of the case, where the oil is strained before again entering the pump.

The Church Pneumatic

The Automatic Motor and Engineering Co., Chicago, makes a unique unit power plant which comprises a four-cylinder, two-cycle motor, and a three-cylinder air-compressor which acts as a pneumatic clutch and transmission mechanism. The air-compressor has its three cylinders arranged horizontally, with their head ends secured to the flywheel; and in addition to its duties of power transmission, it furnishes compressed air for fuel injection into the cylinders of the motor, and may be employed to keep pressure enough in a supply tank to inflate tires or start the motor.

The construction of the Church pneumatic power plant is quite clearly illustrated in Figs. 6 and 7. The air compressor, or controller, as the makers call

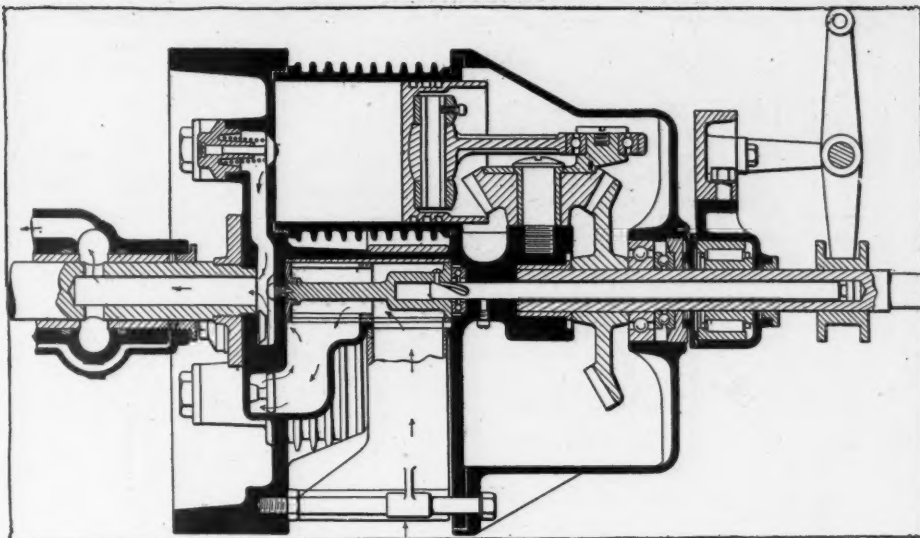


FIG. 6—SECTION OF CHURCH PNEUMATIC TRANSMISSION MECHANISM

it, is shown in section in Fig. 6. The flywheel is shown at the left, secured to the hollow crankshaft of the motor; one of the cylinders is shown in section with a piston in it, and a connecting rod communicates between the piston and a crank-pin secured to the back of a bevel pinion gear. This pinion gear is in mesh with a larger bevel gear which is secured to driving shaft; and the driving shaft is designed for direct connection to the propeller shaft of a vehicle.

In operation, as long as the vehicle remains still, the bevel gear on the driving shaft also remains stationary. Thus, if the crankshaft of the motor is revolved as in cranking, the pinion gear in mesh with the stationary bevel gear will have to revolve around the bevel gear; and in so doing will operate the pistons in the horizontal cylinders. Air is admitted to the cylinders of the air-compressor as indicated by the arrows, and its admission is controlled by an oscillating cylindrical sleeve valve arranged in the center and in line with the axis of the mechanism.

This valve acts as a throttle, and is controlled by the operator by means of the lever at the right of the illustration.

This lever moves a slidable rod located inside of the hollow driveshaft; and this rod has a spiral groove at its opposite end in which a little pin is designed to slide. As illustrated, the pin is secured to the socket end of a rod which is secured to the sleeve or throttle valve; thus as the slidable rod is moved endwise, the pin slides in the groove and causes the throttle valve to revolve. Ports in the sleeve valve are in this manner caused to move into and out of register with ports in the passages through which the air is drawn into the cylinders.

The air that is compressed in the cylinders is forced through automatic poppet valves in the heads, and then through the hollow end of the motor crankshaft to the cylinders of the motor, as indicated in Fig. 7.

Rotary Sleeve Valves Employed

Rotary sleeve valves located at the side of the cylinder heads of the motor are operated by a shaft driven by an inclosed silent chain from the crankshaft. These valves control the admission of the compressed air into the cylinders. An end section of a motor cylinder is shown at the left in Fig. 7, which shows the de-

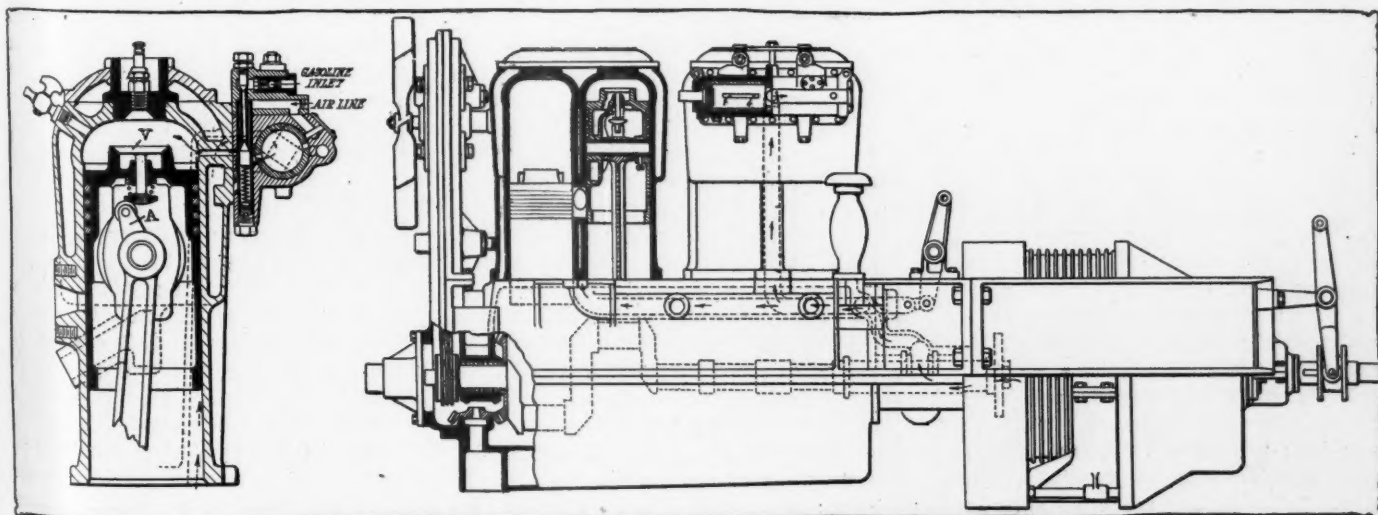


FIG. 7—END AND SIDE SECTIONS OF THE CHURCH PNEUMATIC POWER PLANT

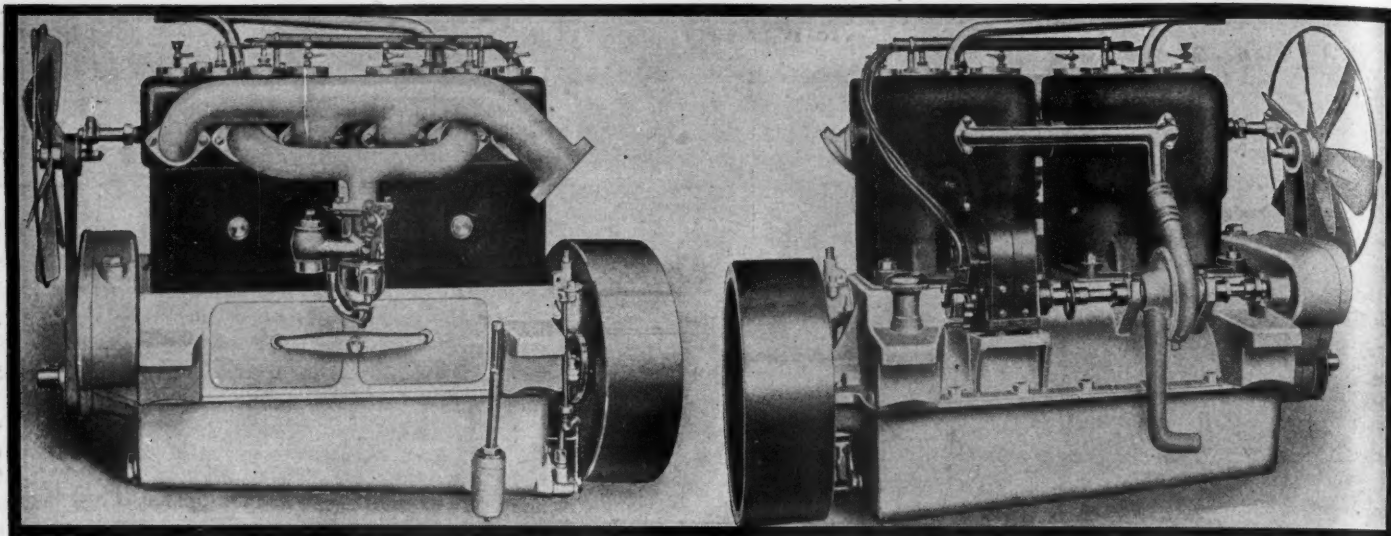


FIG. 8—RIGHT AND LEFT SIDE VIEWS OF NEW WAUKESHA TRUCK MOTOR

sign of the atomizing apparatus by means of which the fuel is mixed with the compressed air as it is admitted to the cylinder through the rotary valve.

In operation, a charge of this fuel mixture is injected into the cylinder just as the piston begins to descend on its firing stroke, and immediately it is ignited in the usual way. The pressure generated by the combustion of the mixture forces the piston downward, and as it nears the end of its stroke an exhaust port shown at the left is uncovered and the burnt gases let out. When the piston begins to rise, the arm A at the upper end of the connecting rod lifts a valve in the head of the piston, and as the piston moves upward any remaining exhaust gases are forced out through it and then through a cored passageway in the piston and cylinder. This latter passage is open to the atmosphere.

Many Brennan Models

Gasoline motors for motor cars, boats and stationary use are made by the Brennan Motor Mfg. Co., Syracuse, N. Y. Five of the Brennan motor models are of the four-cylinder four-cycle vertical design, varying in size and horsepower. The cylinder dimensions of the different models are as follows: Model M, 4-inch bore by 5-inch stroke; model B, 4½ by 5; model 11, 5 by 6; model 12, 5½ by 6; model 12, 6 by 6. Five-bearing crankshafts are employed on the last three models, and three-bearing shafts on the other two.

The model M motor is one of the features of the line for 1912, and as shown, in Fig. 5, its cylinders are of the L-type, cast in pairs. The aluminum crankcase is cast in two parts with the lower portion forming splash compartments and a reservoir for a circulating oiling system. The motor weighs 400 pounds, and it is both an accessible and substantial construction.

Valve stems and tappets are inclosed in individual housings; to render them noiseless; to eliminate dust and dirt, and thereby reduce wear and facilitate lubrication. Valve tappets are fitted with hardened rollers and bearings, and adjustments

are provided to regulate the space between the tappets and valve stems.

The crankshaft is made from an alloy steel which is heat-treated, carefully machined and balanced; and the bearing surfaces are finished by grinding and lapping. A flange is forged integral with the shaft for attachment of the flywheel. The crankshaft is supported on white bronze bearings in the upper half of the case; and the same bearing material is employed for the camshaft and the lower ends of the connecting rods. Timing gears are of steel with 1-inch face.

Cams are forged integral with the camshaft, and all bearing surfaces are hardened and ground. Cylinders and pistons are made of the same material. Pistons are extra long, light weight, balanced and fitted with four eccentric rings each. The piston pins are made from carbon steel tubing hardened and ground; they are secured in the rods, and have a large bearing in bronze-bushed piston bosses. Connecting rods are of I-beam pattern; are extra long to reduce side thrust on the cylinder walls; and the caps of the lower ends are secured by four studs and lock nuts.

Centrifugal Water Pump Used

Lubrication is by means of a force-feed self-contained circulating system, in which a gear oil pump externally located at the left rear end of the case, forces oil to all bearings. The lower half of the case has a horizontal partition divided into four equal splash compartments, and there is an overflow in each compartment to maintain a constant level therein. There are scoops on the lower ends of the connecting rods to pick up oil and conduct it to the crank pins. The lowermost portion of the case forms the reservoir and an oil gauge is provided to show the amount of oil contained therein.

A large centrifugal water pump circulates the water of the cooling system; the water piping and connections are short, simple and accessible and an adjustable belt-driven fan is fitted.

In the way of ignition, provisions are made for either a double system with magneto and timer, or a dual system in which only the magneto is fitted. The bracket for both the water pump and magneto are located on the right hand side of the motor, where they are very accessible and out of the way; and by driving the magneto from the pumpshaft, it is claimed that the oscillating strains of the magneto armature are eliminated from the teeth of the driving gears.

Waukesha Long-Stroke Motor

Waukesha motors, manufactured by the Waukesha Motor Co., Waukesha, Wis., are made in seven different sizes, and four of these may be incorporated in unit power plants:

The feature of the Waukesha line for 1912 is a new long-stroke motor designed specially for truck service. It is of the four-cylinder four-cycle type, with L-head cylinders cast in pairs. The bore and stroke is 4¼ and 6¾ inches. This model embodies many of the latest ideas in truck motor design and construction, including enclosed valve and a circulating oiling system, and its simplicity and accessibility are quite clearly shown in Fig. 8.

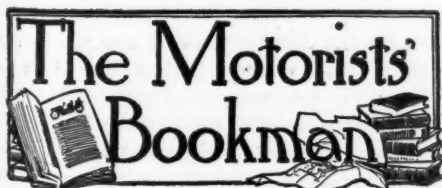
Cylinders and pistons are made of the same material, and are carefully ground to size. The pistons are 6 inches long and have four eccentric rings, which are heat-treated then ground and lapped to fit. Piston pins are anchored to the connecting rods and they are made of seamless steel tubing, case hardened and ground. The lower ends of the connecting rods are lined with special bronze bushings 1½ inches in diameter and 2¼ inches long.

A chrome nickel steel crankshaft is employed which is heat-treated. The use of this steel properly treated stiffens the shaft and improves the character of the lapped bearing surface so that a mirror-like surface may be obtained. Every bearing and fillet is lapped after grinding; and large integral thrusts are provided on each end of the shaft to provide for lateral pressures of the clutch.

Cams are forged integral with the camshafts, and all bearing surfaces are case hardened and ground. Pushrods are adjustable, and all valve mechanisms are enclosed. The valves have cast iron heads; cast with a steel reinforcing disk, which is electrically welded to a carbon steel stem having a hardened lower end. The valves are very large, having a diameter of $2\frac{1}{8}$ inches clear; the lifts are low, and the valves are guided in lapped bushings for two-thirds of their length.

The crankcase, which is of cast aluminum, is of stiff and substantial construction, and so designed that the cylinders can be removed quickly and easily. The case is divided horizontally and the pistons and rods can be removed from below without disturbing the cylinders. The crankshaft is supported by three bearings in the upper half of the case; and force feed pipes conduct oil through the case to the main bearings of the crankshaft and camshaft.

The lower portion of the case has adjustable oil level pockets which allow a light or heavy feed of oil, and the lowermost portion of the crankcase forms a reservoir in which enough oil is carried for about 1,000 miles of travel without replenishment. Lubrication is maintained by force feed to all main and camshaft bearings. An oil pump, which is externally located at the left rear end of the oil reservoir, maintains the circulation of the lubricant; and scoops are provided on the ends of the connecting-rods which oil the lower rod bearings, and splash oil into the cylinders, pistons, and internal bearing surfaces. Cooling is effected by water circulated by a large all-bronze centrifugal water pump; and an adjustable belt-driven fan furnishes the air draft. A governor is provided to control the engine speed and prevent careless racing of both the motor and truck.



Commerce in the Near East

THE Levant Trade Review, published quarterly by the American Chamber of Commerce for Turkey, at Constantinople, recently received, voices a strong desire for closer trade relations between America and the near east. To say "from Chicago to Teheran" today conveys no such sense of weary distance as was expressed by the old saying "from Dan to Beersheba," and this new publication evidences a widely concerted effort to introduce into the land of the olden Dan and Beersheba American methods and mechanisms to shorten space and lengthen time. That "a motor road roller is doing business in Jerusalem," the "need of Mesopotamia at once is American pumps

Britishers Adopt the Displacement Contest Rule

LONDON, March 1—Following a recent ruling of the Royal Automobile Club, motor car contests in Great Britain will be classed on a basis of cylinder displacement much like that of the American Automobile Association, instead of upon the diameter of the cylinder bore as heretofore. The new standard classes based on cylinder capacity which were recently arranged by the Brooklands track management have been officially adopted as standard by the R. A. C. for future contests.

Formerly, the standard classes were based on the horsepower as determined by the R. A. C. formula, which is exactly the same as the present S. A. E. horsepower formula in use in America. This takes no note of the length of the stroke, and where, as in England, this was the basis for classification for speed contests, it resulted in the production of special racing engines with abnormally long strokes and comparatively small bores.

The new method divides motors into nine classes, in each of which the maximum cylinder capacity and maximum weight are specified. In this respect the

classification is almost the same as the class B divisions of the American Automobile Association, in which there are six divisions on a basis of cylinder capacity, or more properly, piston displacement, with a weight limitation.

The influence of the small cars in British racing is to be noted in the class A of the R. A. C.'s new rating, which specifies a maximum of 100 cubic inches displacement as against the American smallest class of 160 cubic inches maximum. It is interesting to note the greater weights allowed by the British rating. In the small class, A, which corresponds with the A. A. A. division 1B, a weight of 1,400 pounds is allowed with 100 cubic inches displacement, while the American division 1B with an allowance of 160 cubic inches limits the weight to 900 pounds. In weighing in, however, the British rules provide that the weight of the driver be included with that of the car, while the car alone is weighed in America. The change probably will result in the retirement of some of the abnormalities which have been seen and will cause a return to more rational bore-stroke ratios.

driven by oil-engines," the "trade in motor cars is brisk in Servia, while the government of that country intends using them in the postal service," and a lively interest is shown in different sections of the near east in highway making and railroad building, proves a general awakening and earnestness of endeavor in the land of the camel and the handmade. It is suggested in the December quarterly that the name of the parent organization be changed from American Chamber of Commerce for Turkey to American Chamber of Commerce for the Levant, thus indicating its wider field of action, which would seem very appropriate. Whether the present name be retained or the proposed one adopted, the Levant Trade Review is a welcome addition to current Levant literature.

Great Cities

Historical and descriptive sketches of sixteen continental cities are presented in one volume under the title "A Guide to Great Cities; Western Europe." This is an addition to the Guide Series by Esther Singleton, being the tenth volume in this popular series on travel. Crowded with historical facts simply expressed, every sentence presents a theme for supplemental reading. The book is illustrated with sixteen beautiful halftones. The Baker & Taylor Co., New York.

Route Books of the British Isles

Five more volumes of the Burrow's R. A. C. Handbooks have been received, being "Motoring in Wales," "Motoring in the West of England," "Motoring in East Anglia," "Motoring in Ireland," and "The Great North Road." These lit-

tle volumes, in exceptionally handy form, contain, in limited space, a wonderful amount of just the information desired by the motorist. From fifteen to nearly twice that number of maps supplement the text in each booklet, while numberless illustrations, etchings, halftones in black and white, sepia or in colors, are enticing admonitions to the motor tourist that he cannot afford to miss seeing that particular spot. Edward J. Burrow, Publishing, Cheltenham, London, Eng.

A. S. M. E. Year Book

The 1911 year book of the American Society of Mechanical Engineers contains an alphabetical list of all its members, as well as a geographical one. A similar arrangement of affiliate members in the Gas Power section is included.

Maintenance of Motor Cars

Written with the object of assisting the amateur motorist, this book in a simple and elementary manner deals with the problems confronting the inexperienced car owner. Chapter 1 deals with the subject of cleanliness, which is an essential factor in any mechanism in order to keep it in good working order; chapter 2 discusses the engine and the cause of loss of compression and its remedy—valve grinding; under the subject of ignition the accumulator system and its troubles is dealt with; chapter 4 takes up the problem of lubrication, followed with a chapter on carburation. The cooling system, steering gear, brakes, transmission and tires are other topics handled in this book, and a useful chapter on diagnosis is included. Eris W. Walford, published by Iliffe & Sons, Ltd., London, Eng.



The Motor Car Repair Shop

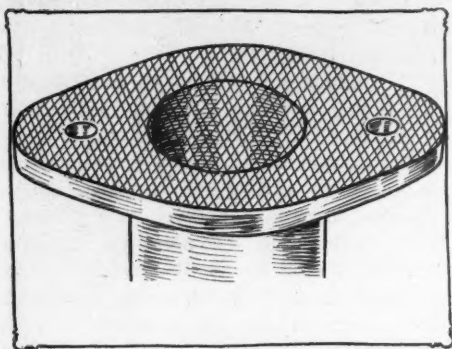


FIG 1—A SIMPLE VAPORIZER

A PITTSBURGH motorist lays claim to a discovery by which he declares he can produce an increase of 3 miles in the capacity of a gallon of gasoline. The method as described by the discoverer is as follows: "I procured a piece of wire screen, cut it in the shape of the gasket between the carburetor and the intake manifold, but leaving it blind, that is, with the screen across the inlet. I put this between two gaskets and fastened the whole back in place as in Fig. 1. The result was an increase of 3 miles per gallon of fuel." This scheme tends to break up the fuel globules and produces a more perfect mixture.

Spark-Plug Tester

It is a well known fact that a defective spark plug often can be tested and appear to be satisfactory by simply removing it from the cylinder, and without disconnecting the high-tension cable and resting the base of it against the cylinder so that the spark points may be watched. Many motorists test their plugs in this way; some allowing the motor to run on three or five cylinders, according to the number of cylinders on the motor while they note the regularity with which the spark occurs at the points of the suspected plug; while those having ignition systems with vibrating coils crank the motor slowly until the cylinder from which the plug is removed has its piston on the firing center, at which time, if the battery current is on, a stream of sparks may be seen to occur between the sparking points.

It often happens that a plug which gives a perfectly good spark when tested in the above manner will fail entirely when replaced in the cylinder and subjected to the pressures therein. This generally is due to defective plug insulation through which the spark will not pass when the spark points are separated only by air at atmospheric pressure; but when the pressure of the air or gas between the points is increased to from 60 to 80 pounds per square inch the electrical resistance of the gap also is greatly increased, and as electricity always takes the path of least re-

sistance, it is more apt to jump through the defect in the insulation, than across the gap at the sparking points of the plug.

In order, therefore, to provide a means for testing spark plugs under conditions more nearly like those that take place in the cylinder of the motor, many repair-shops now are equipped with compressed air testing boxes, in which the plugs may be fitted and the sparking at the plugs watched while under pressure. One of these testing boxes is shown in Fig. 4. It is made of cast iron, with one side enclosed by a brass plate with four glass windows. In the top of the box and opposite each window, four holes H are tapped into the box for the reception of the spark plugs P. When four plugs to be tested are secured in place, the valve V is opened, and compressed air admitted to the box;

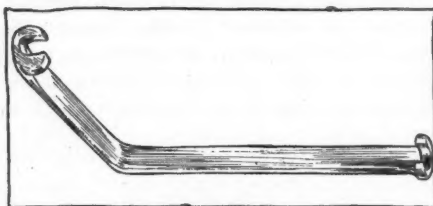


FIG 2—HANDY SPECIAL WRENCH

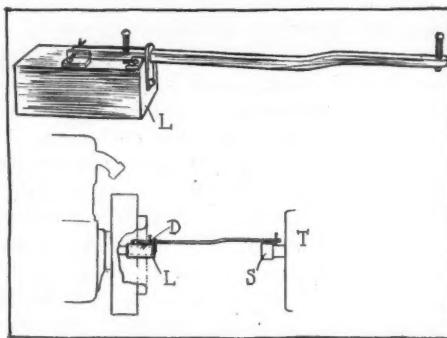


FIG 3—AN ALIGNING TOOL

the supply being obtained either from a hand pump, or some other source. A gauge G is fitted to show the pressure in the box, and when it shows the desired amount, ignition wires from the motor, or from a separate ignition outfit are attached to the plugs and the current started through them. The sparking can be plainly seen through the windows, S; and at the end of the test, the compressed air is released by means of the relief cock C.

Aligning Motor and Gearset

Unless the motor and transmission gearset is in proper alignment, excessive wear will take place in the universal joint between the clutch and transmission mechanism, which in time will give rise to noisy operation. It also might give rise to clutch troubles. Misalignment of motor and gearset, may be caused by sagging of the main frame as a result of overloading, or it may be due to carelessness of the assembler or

repairman. Shims or flat square pieces of tin or copper with a bolt-hole in the middle often are used between the transmission and frame to line it up with the motor, and when a gearset is removed from the frame for inspection or repair, one should be careful to look for these and see that they are properly replaced when the gearcase is re-assembled into position. In order to facilitate the operation of lining up a gearset and motor; an ingenious little device is used in the repairshop of the Peerless branch, Chicago. This device consists of a steel block L, Fig. 3, bored out to fit on the tail-end of the motor crankshaft, as indicated in the sketch in the lower portion of the illustration. Then, by means of the adjusting screw D, the projecting arm, which is hinged to the block, is arranged so that the screw in the end of it just begins to touch the protruding main shaft S of the transmission gearset T. The crankshaft of the motor then is revolved, and the end of the arm at the gearset is carefully watched to see if the contact or relative distance between the point and the shaft S remains the same throughout the revolution. If the gearset is out of alignment with the motor, the end of the arm will be farther away from the shaft at one point in the revolution than at an opposite point.

Handy Special Wrench

In Fig. 2 is shown a special wrench which is employed to great advantage in the same Chicago repairshop above mentioned. It is made of a heavy steel bar of rectangular section, bent L-shape, with the two jaws bent inward at right angles to the arms of the bar. This wrench was made especially for the purpose of conveniently tightening the nuts by means of which the steering gear is secured to the main frame of the Peerless car. This illustration is shown not only for the benefit of Peerless agents and drivers, but as an example of what might serve to facilitate the operations of many other repairmen as well. There are thousands of repairshops where time and hard labor could be saved by means of such tools.

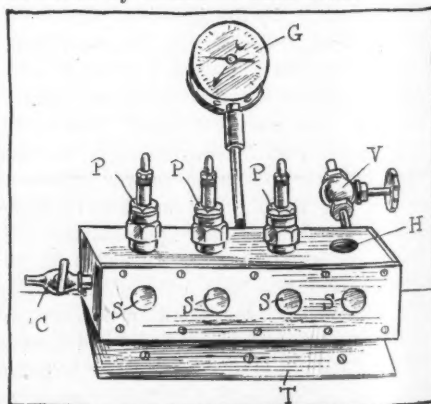


FIG 4—SPARK PLUG TESTER



Current Motor Car Patents

1,019,061—Pole-Reversing Timer or Distributer. Edwin S. Lincoln, Brookline, Mass., assignor to Electric Goods Mfg. Co., a corporation of Maine. Filed May 13, 1911. Serial No. 627,010.

1,019,097—Nut Lock. Frank E. Spencer, Thomburg, Pa. Filed December 12, 1911. Serial No. 665,368.

1,019,101—Wheel. John E. Strietelmeier, Cincinnati, Ohio, assignor to the Ideal Wheel Co., Cincinnati, Ohio, a corporation of Ohio. Filed December 14, 1910. Serial No. 597,288.

1,019,121—Radiator. Jacob B. Beam, Punxsutawney, Pa. Filed September 26, 1910. Serial No. 583,762.

1,019,128—Carbureter. Charles O. Bulock, Cleveland, Ohio. Filed April 6, 1911. Serial No. 619,197.

1,019,153—Road Scraper and Grader. Samuel E. Hughes, Alexandria, Ind. Filed March 14, 1911. Serial No. 614,405.

1,019,160—Carbureter. Barry Ivor, Chicago, assignor of one-sixth to John D. Gazzolo, one-sixth to Harry Q. Turner, one-sixth to John D. Hartford, one-sixth to Fred Freer, and one-sixth to Herbert R. McPherson, Chicago. Filed October 24, 1910. Serial No. 588,834.

1,019,161—Strainer and Water-Separator for Gasoline Supply. Barry Ivor, Chicago. Filed July 5, 1911. Serial No. 636,929.

1,019,177—Internal-Combustion Rotary Engine. Rolla R. Morton, Fresno, Cal. Filed February 25, 1909. Serial No. 480,049.

1,019,192—Vehicle Wheel. Adolph Schick, Wheeling, W. Va. Filed October 20, 1910. Serial No. 588,102.

1,019,209—Carbureter for Internal-Combustion Engines. Tom Welsh, Moffat, Scotland. Filed January 21, 1910. Serial No. 539,365.

1,019,222—Internal-Combustion Engine of the Revolving-Cylinder Type. Alfred B. E. Cheeseman, London, and Joseph G. Florence, Walthamstow, England. Filed May 27, 1911. Serial No. 629,907.

PATENTS ISSUED MARCH 5, 1912

1,019,223—Rotary Engine. Christoffer Christoffersen, Philadelphia, Pa. Filed June 20, 1911. Serial No. 634,200.

1,019,243—Nut Lock. Arthur Newell Gandy, Brundage, Ala. Filed September 7, 1911. Serial No. 648,202.

1,019,254—Motor Vehicle. Russell Huff, Detroit, Mich., assignor, by mesne assignments, to Packard Motor Car Co., Detroit, Mich., a corporation of Michigan. Filed May 27, 1907. Serial No. 375,962.

1,019,267—Friction-Clutch. George Cushing Martin, Los Angeles, Cal. Filed May 19, 1910. Serial No. 562,297.

1,019,277—Nut Lock. Peter G. Rapp and Peter H. King, Chicago. Filed January 11, 1911. Serial No. 602,040.

1,019,286—Pneumatic Tire. Willard Irving Twombly, New York, assignor to Twombly Motors Co., New York, N. Y., a corporation of New York. Filed July 22, 1910. Serial No. 573,180.

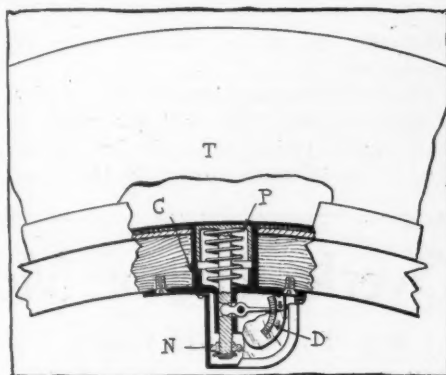


FIG. 2—TIRE GAUGE

of the sleeve for drawing the piston rod and the piston against the tension of the spring; thus providing a suitable adjustment.

Terpening Tire Alarm—No. 1,019,557, dated March 5; to Elmer Alonzo Terpening, Mokena, Ill.—The Terpening tire alarm consists of a pressure gauge permanently mounted in or on the felloe of the vehicle wheel, with electrical connections between the gauge and a bell or alarm mounted on the dash, so that when the air pressure in the tire falls below a safe running limit, the indicator of the gauge will complete the electrical circuit and sound the danger alarm.

The arrangement of the mechanism is graphically illustrated in Fig. 1. One of the wires from the gauge G is grounded on the metal of the wheel hub, and electrical connection is made through the hub, the wheel bearings, axle, springs, vehicle frame and a short wire W to one terminal of the battery B. The other wire from the gauge is insulated from the hub and axle of the vehicle; and a brush and commutator or collector-ring is used to provide an insulated connection between the gauge and the junction box X; from which the current passes through the alarm A and then through a short wire connection back to the other terminal of the battery. The junction box X provides connection, between the four insulated leads from the

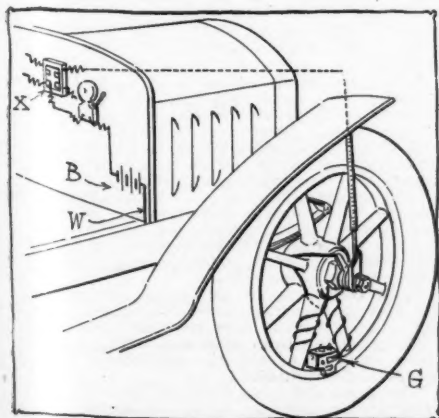


FIG. 1—TERPENING TIRE ALARM

1,019,301—Emergency Attachment for Vehicle Wheels. Edward T. Burrowes, Portland, Me. Filed June 23, 1909. Serial No. 503,854.

1,019,336—Vehicle Spring. Daniel J. McCluskey, San Francisco, Cal. Filed June 8, 1910. Serial No. 565,709.

1,019,354—Explosive Engine. Henry J. Podlesak, Chicago. Filed December 7, 1910. Serial No. 596,063.

1,019,370—Agricultural Implement. Andrew Schloemer, West Allis, Wis. Filed March 20, 1911. Serial No. 615,565.

1,019,374—Valve. James Shaw, San Francisco, Cal. Filed May 11, 1910. Serial No. 560,711.

1,019,421—Bracket Attachment. Joseph W. Briggs, Reward, Cal. Filed March 2, 1911. Serial No. 611,772.

1,019,468—Fire-Protector. Ralph V. Hastings, Chicago. Filed March 8, 1911. Serial No. 613,141.

1,019,469—Combined Antiskidding and Jack Attachment for Motor Cars. Florence Frank Heffernan, New York. Filed May 20, 1911. Serial No. 628,378.

1,019,488—Valve for Explosion Engines. Arthur Constantin Krebs, Paris, France, assignor to Societe Anonyme des Anciens Etablissements Panhard & Levassor, Paris, France. Filed June 15, 1910. Serial No. 566,983.

1,019,495—Internal-Combustion Engine. Alonzo Lafontaine and Rosario Lafontaine, St. Stanislaus, Quebec, Canada. Filed August 28, 1911. Serial No. 646,335.

1,019,513—Gas Engine. Robert S. Moore and James Lee Simmons, Washington, D. C., a corporation of the District of Columbia. Original application filed November 1, 1910. Serial No. 590,236. Divided and this application filed March 30, 1911. Serial No. 617,855.

1,019,536—Pneumatic Wheel. Adam Charles Schroeder, Derry Station, Pa., assignor of one-half to Conrad Proesslet, Pittsburgh, Pa. Filed June 17, 1911. Serial No. 633,685.

four vehicle wheels, and the main wire which communicates with the alarm.

Bulock Carbureter—1,019,128, dated March 5; to Charles O. Bulock, Cleveland, Ohio.—The Bulock carbureter is a float-feed type whose design is shown in Fig. 3. The feature of its construction is the design of its hollow piston valve P. The carbureter comprises a cylindrical chamber C having a main air inlet A and a mixture outlet O. The hollow piston valve is slidably mounted in this chamber and adapted when moved away from the air inlet port, to close the mixture outlet port O, the interior of the piston valve being always in communication with the auxiliary air inlet X. The spray-nozzle N is arranged adjacent the main air inlet port, and an adjustable needle valve V is fitted into the nozzle to regulate the flow of fuel through it.

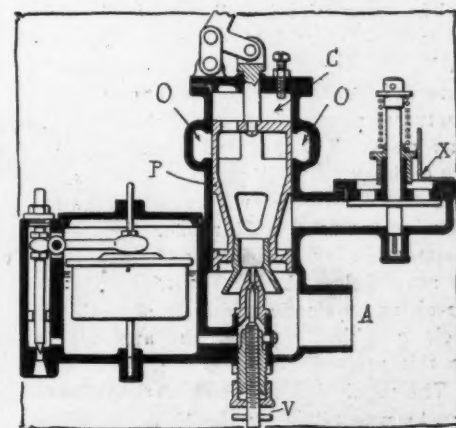


FIG. 3—THE BULOCK CARBURETER

The Realm of the



Milestone for Industry

Action of N. A. A. M. on Overload, Speed and Body Weight Important to Truck Men

THE National Association of Automobile Manufacturers by legislating last week on how much overload in pounds a truck can carry, by legislating on the weight of body that different-capacity trucks must carry, and by legislating the speed at which these different vehicles shall go, arrived at one of the most important milestones in the motor truck industry in America. In unmistakable terms it told the truck maker that the days of a 3-ton truck carrying a 4-ton load are over. The biggest overload permissible on a truck of this capacity is 1,200 pounds, or approximately 3.5 tons.

In the official tabulation which was published in last week's Motor Age, page 5, the complete overload on different-capacity trucks was given. The chart on the opposite page graphically illustrates this. No matter what the capacity of truck, the permissible overload is 20 per cent or one-fifth of the actual rated load. The reason for controlling this overload question, as well as that of speed, and that of body weight, is to get the required mileage from the tires. It is customary to sell a truck chassis fitted with solid tires of capacity for the rated load of 5 or 7 tons. The truck maker does not fit the body. Sometimes a body weighing as much as 2,500 pounds has been placed on a 5-ton chassis. According to the new schedule, 1,400 pounds is the maximum body weight for such a truck. This limitation protects the tire against overload, because no factor of safety is recognized by the tire maker for such an overload as 1,000 pounds in a foolishly heavy body.

The destruction in solid rubber tires, due to overload, is well given in the address of S. V. Norton, of the Goodrich company before the truck committee and truck manufacturers at the N. A. A. M. headquarters last week. This address is reproduced in its entirety on these pages. It shows how one case of overload will cause the destruction of a set of solid rubber tires. This destruction is not visible to the eye, but it is nevertheless there. The illustration by breaking an elastic rubber band in this article graphically proves the argument as to this proposition.

The regulation of speed of the different trucks was taken by the N. A. A. M. because too high speed is as equally destruc-

tive of tires as overloading. A loaded truck going over a rough street car crossing at too high speed will do the same injury to the tires as a case of overload. Rubber has its best working condition and is affected by overload and strain. It is as susceptible to fractures as other materials. A bow of wood may be amply strong to shoot all the arrows an ordinary person will send from its cord, but when the strong man gets hold of it and bends it but once beyond its strength, although it may not break, it has lost the elasticity which it previously had and is not able to do its regular work.

Rapid starting and braking are equally injurious to tires. The heat generated by a too rapid application of the brakes imposes a strain and overload on the tires.

This is similarly true when starting too rapidly.

Examples are numerous of overloading throughout the country by too heavy bodies, too heavy loading, and hauling trailers. One St. Louis company boasted to making its 5-ton electric truck pull a 5-ton trailer. This company complained of not getting sufficient mileage from its tires. It failed to realize that the overload of the trailer destroyed the elasticity of the tire. Another electric concern sold chassis without bodies for delivery work, the chassis carrying a certain size of rubber tire. The buyer used too heavy bodies, the trucks were not able to give their guaranteed mileage and it was necessary to add heavier tires and more battery. This was all due to body overload.

Overloading of Motor Truck Tire As

By S. V. Norton

WHAT is meant by the overloading of rubber tires? In the process of manufacture crude gum is mixed with pigments and the whole mass is kneaded together until the compound becomes homogeneous. After various intermediate steps, the rubber is placed in a mold and vulcanized. During vulcanization the tire assumes a more or less permanent form, to which it will normally return if it is not stretched or compressed beyond certain definite limits. If the stretching or compression exceeds these limits, however, the strain will invariably cause a rupture or disintegration of the rubber.

To illustrate: Take a strong, properly vulcanized rubber band. Stretch it moderately, release it, and it will return to its normal shape. The process may be repeated indefinitely, and the band will resume its shape. Stretch it beyond its limit of elongation, however, and the rubber breaks, and you can't restore it to its previous condition. The damage has been done, the rupture is permanent. Similarly, a piece of rubber properly vulcanized may be compressed within certain limits; released, and it will resume its normal shape. The compression may be repeated an indefinite number of times, depending upon the quality of the compound. So long as its limit of compression has not been reached, the rubber will continue to spring back into shape and nothing but abrasion or some other physical or chemical action will destroy its elasticity. Compress it beyond its limit of cohesion, however, or, in other words, beyond its power of resistance, and the rubber breaks down or ruptures just as inevitably as in the case of stretching beyond its limit of elongation. The rupture is absolute and permanent. No method yet devised will restore to the unit its former elastic qualities. The damage is done, and disintegration has commenced—not because the average load exceeded the limit of resistance, but because some one load exceeded it, and started the rupture. If I can impress upon you the great danger of ruining solid tires from once overloading them I shall feel gratified.

Tire manufacturers have adopted a schedule of carrying capacities which, with but slight variations, is now considered standard. The factor of safety in the schedule is nil. So many other factors enter into the matter, such as excessive strains due to bumps, depressions in the roadway, negotiating grades, overspeeding, and the severe use of brakes, that no provision has been made for overload.

There are three kinds of overloading. The first is due to undersized original tires. I fully realize that the competition in your business

makes it necessary for you to economize wherever possible in the equipment of your trucks. You build the best machines that money and skill can devise, and you offer them for sale fully guaranteed—except for tires. Without knowing the danger you are running you may perhaps equip them with the smallest tires that will come within our schedule of carrying capacities. Then, if the tires fail to deliver the service expected, the responsibility is at once automatically shifted to our shoulders, and we are expected to live up to our reputations for liberally taking care of our product. Suppose your sales agents order just the chassis and then have special bodies built—bodies too heavy in themselves, or so large as to permit the carrying of loads far in excess of those the tires are able to sustain without breaking down. What happens? Your customers soon have trouble with their tires, and they complain that the cost of maintenance is more than they had been led to believe.

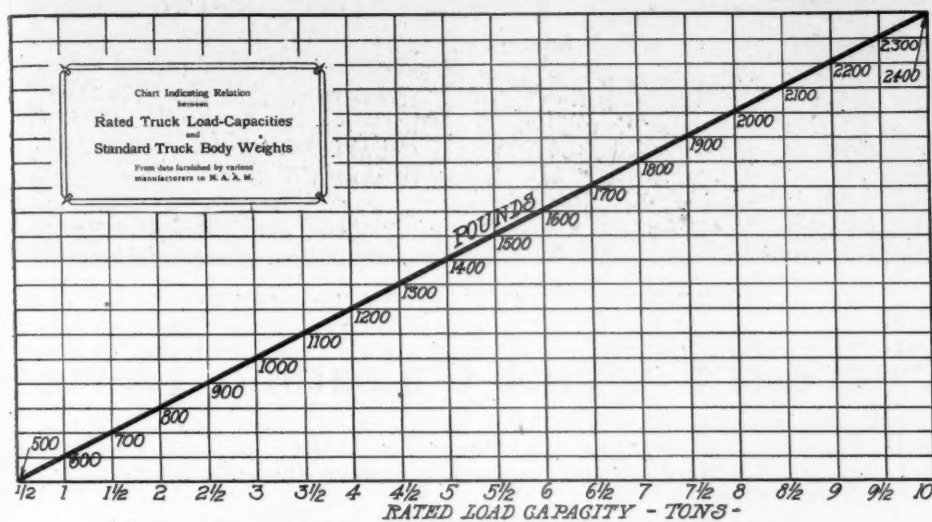
The second kind of overloading is due to disproportionate equipment. Sometimes we find that trucks whose tire equipment, regarded as a whole, is ample for the service required, will be lacking in carrying capacity at one end, while at the other end there may be an excess capacity over the actual demands. I have in mind a case in which the proportion of weight carried by each axle showed that the front tires were considerably overloaded, while those on the rear had an excess capacity of nearly a ton. The owner of the truck protested his innocence, saying that he had never been told he was misusing his tires. The proper sized front tires applied, there was no further trouble.

The third kind, which is at once the most prevalent, the most illusive, and the hardest to cope with, is due to the improper loading of the truck. Sometimes this may be the result of faulty distribution of the load over the front and rear axles, which may cause the failure of the tires wholly without the knowledge of the owner. This is well illustrated in the case of a wholesale grocer whose custom it was to put all light packages on the front of the truck and save the heavy ones for the rear, with barrels of pork, molasses, sugar and kerosene on the tailboard.

In a coal concern the loose load was distributed in the truck body, and then the rear was piled up with bags of coal. In each of these cases the total load was within the combined capacity of the tire equipment, but not properly distributed.

The most difficult phase for the tire maker to overcome, however, is the deliberate placing on the truck as a whole too heavy loads for the tires to carry. The way is paved for the

Commercial Car



N. A. A. M. CHART ON OVERLOAD, SPEED AND BODY WEIGHTS

Described by Expert Before N.A.A.M.

abuse even before your prospect has bought a truck. I refer to the temptation to which some of your salesmen yield to carry heavier and bigger loads than they should when they give demonstrations before a prospective purchaser. When it becomes known that a man is thinking of buying trucks he is besieged by agents asking the privilege of giving demonstrations. A fierce competition then ensues to win the order, by showing how much merchandise may be moved within a given period, and how fast it can be carried. The result is that some of the loads carried in these competitions vary from 50 per cent to 100 per cent over the rated capacity of the tires.

The drawing of trailers is another means of improperly loading tires. No doubt this is an economical means of hauling, but trucks so engaged are placing a greater strain upon their tires, and they should be at least the next size larger than those which would safely carry the truck without a trailer.

Turning now to the effects of overspeeding on solid tires, I ask you to consider three things. They seem so axiomatic that they need only be mentioned briefly. First, overspeeding generates excessive heat in the tires, which tends to shorten the life of the rubber. Even though not overloaded, they may be driven so fast that they are burnt up, as it were, in a very short time. Second, it accentuates shocks and jars due to unevenness in the roadway. The stresses thus set up are really the equivalent of sudden overloads, and they tend just as effectively to cause the premature failure of the tires as though they were loaded beyond their capacity. Third, it induces the severe use of brakes, especially in thoroughfares in which there is much traffic. This in turn is apt to cause unnecessary friction with the road surface, which, of course, wears out the tires promptly.

Let us next consider who pays for these abuses. In guaranteeing the truck exclusive of the tires, the truck manufacturer conveniently arranges to "step out from under." The burden therefore seems to fall upon the truck owner or the tire maker, although I say frankly that the ultimate consumer bears most of the load. When tires fail prematurely the truck owner looks to us for an adjustment. Generally our salesmen have an accurate knowledge of the conditions under which such tires are operated, and if they have been overloaded we have taken occasion to warn the operator that we can not be held responsible for failure to deliver normal mileage. Many users seem to feel that because their average loads do not exceed the rated carrying capacities of their tires they have not overloaded them, and consequently the rubber manufacturer should furnish other tires, free, to run out the guaran-

teed mileage. As there is no gauge by which the loads carried can be recorded, the tire maker has to accept the statement of the truck owner, or run the risk of an unpleasant controversy if he questions it. The truck is laid up—or perhaps merely the tire, if it is of the demountable type—and an adjustment or a rapid renewal is made, prematurely. Either method of settlement is more costly than continued service upon proper conditions. The truck owner complains that the cost of maintenance is higher than it had been represented to him, although the chances are he had not been impressed with the high cost of overloading. You will admit that it is not sound business for a manufacturer to replace an article without due charge, if the user of the commodity has wittingly or unwittingly destroyed it. In self-protection, therefore, as well as for the education of the user, we stand our ground, and sometimes we have controversies through which we pay our share. We write letters, we send telegrams, we make personal calls and we send tires by express—all of which are expensive, and might have been avoided. Occasionally these contentions result in the loss of the customer, who decides to use another make of tire. In such cases, we feel that we have merely transferred an undesirable account to a competitor, who takes up the burden. Sometimes, however, for the sake of future business under saner conditions, we pay our part of the bill at once as a matter of policy. We make concessions which curtail the profit from the sale of the new tire, but as most users realize the advantage of renewing with a larger-sized tire, the business relations from that time on are upon a much more satisfactory basis.

But you truck makers also pay, indirectly, because you sell fewer trucks than you might, were it not for the unnecessarily high cost of maintenance which these abuses entail. I venture to say that at this moment your sales departments are all spending time and money trying to overcome the honest conviction on the part of several prospective purchasers that the chief reason for their not buying trucks immediately is, not their unwillingness to make the original investment, but their fear that the cost of upkeep will more than offset the saving to be gained through the use of your trucks. And the chances are that their principal concern is over the cost of tires. This idea has gained undue prevalence because of the unfortunate experience of many operators who have been obliged to pay for destroying their own tires by overloading and overspeeding them, whereas, if they had used tires large enough to perform their work economically, they would be enthusiastic advocates of motor delivery.

Another One Motorizes Minneapolis Strengthens Its Fire Department and Now Has Eight in Fleet

MINNEAPOLIS will have eight pieces of motor fire apparatus by July 1, where it now has two, says Fire Chief C. W. Ringer. The department is to experiment in building a combination hose and chemical wagon at the department shops on a purchased chassis. The council has approved contracts for two combination chemicals and hose cars at \$5,140 each and another combination motor vehicle at \$5,500. It authorized purchase of one \$900 car for the building department. The committee has rejected bids on three roadsters for fire district chiefs for heavier models than first specified. The fire committee tentatively recommended purchase of two motor pumping engines from one big concern, provided models which are being built are perfected successfully. The cost is estimated at \$6,500 and will be the first in use locally.

J. T. Ruane, superintendent of the fire insurance patrol, says that the organization plans to erect a new building when the two wagons drawn by horses will be supplemented by motor trucks. The city contemplates purchase of one or more motor trucks for the sewer department. Alderman G. V. B. Hill says the trucks will save \$12 a day each. Much opposition has developed in the council to the heavy demands for more motor cars. Alderman E. J. Sweeney urges that motor cycles be bought in many instances. The opposition in part is due to the heavy expense for upkeep which the aldermen expect to be reduced now that the city does its own repair and inspection work.

NEW TAXICAB VENTURE

A new business venture in York, Pa., known as the York Taxi Co. will take over the several cab companies in York and begin business about April 1. The company will do a general transportation business by means of taxicabs and motor trucks, and from time to time extend its operations, even to running stage lines with motor trucks. The company was organized in this city last week with a capital of \$15,000 and will begin work with at least five taxicabs and one truck, the latter for hauling baggage. The company has secured options of cab companies now doing business here and they

will be purchased. The company is composed of: John G. Mercur, Washington, D. C., president; Robert S. Frey, York, secretary and treasurer; and Louise W. Mercur, Washington, D. C., and John W. Etter, Red Lion. These compose the board of directors.

COLUMBUS BUYS APPARATUS

The fire department of Columbus, Ohio, has decided to do away with horses and use motor cars in hauling its fire equipment in the future. The first step towards this change was the appropriation of \$50,000 for the purchase of motor cars with which to haul the steamers and hook and ladder trucks which are now in use. The new equipment will be assigned to the central part of the city and work of substituting motor-driven equipment for the horse-drawn equipment will continue until all of the horses are displaced. The experiment, it goes without saying, will be watched with great interest.

CANADIAN TAXICAB RATES

The new rates for the hire of taxicabs and motor cars in Winnipeg, Canada, will be engraved on brass plates and securely fastened either inside or on the running board of every taxi in the city. The present leather-bound tariff cards are not satisfactory. In many cases they are not displayed at all, in spite of the law.

The new taxicab tariff is as follows: For conveying persons from one place to another in the city of Winnipeg the following charges shall be made which shall commence from the arrival of the taxicab at the place of call, and shall cease when the passenger has paid his fare:

For four persons or fewer for the first $\frac{1}{2}$ mile or fraction thereof, 50 cents. For each additional $\frac{1}{4}$ mile or fraction thereof, 15 cents. For each additional person over four for the whole journey, 10 cents. For waiting at request of passenger while under engagement, for each 2 minutes limited to 10 minutes, 5 cents. After which the charge shall be at the rate of \$4 per hour.

Motor cars, including taxicabs, by the hour—For four persons or fewer \$4 per hour; for each additional person over four, \$4 per hour.

Fractions of hours for any drive exceeding 1 hour shall be charged at pro rata rates as above established for drives by the hour.

For each mile or fraction thereof over 1 mile traveled to take up engagement either by distance or by the hour, 20 cents.

No fare shall be charged for children under 8 years of age in charge of an adult.

No charge shall be made for traveling bags, valises, boxes or parcels, which passengers can carry by the hand.

One trunk may be carried for which a charge of 25 cents may be made.

NEW COMMERCIAL CAR AGENTS

City	Concern	Agency
Baltimore, Md.	Everitt Auto Co.	Board
Baltimore, Md.	G. R. Snodell	Commer
Columbus, O.	Avery Truck Co.	Avery
Baltimore, Md.	Callahan Brothers Co.	Morgan
Baltimore, Md.	Chase Motor Truck Co.	Chase
Brooklyn, N. Y.	Sterling Place Garage	Lippard-Stewart
Newark, N. J.	Newark Power Wagon Co.	Lippard-Stewart
Poughkeepsie, N. Y.	Ryder Motor Co.	Lippard-Stewart
Sedro Woolley, Wash.	H. Heinzerling	Lippard-Stewart
Rochester, N. Y.	Turk & Brown	Lippard-Stewart
Columbus, O.	Dean DeWitt	Lippard-Stewart



WHILE THE WAGON IS AWAY THE HOPPER IS FILLED

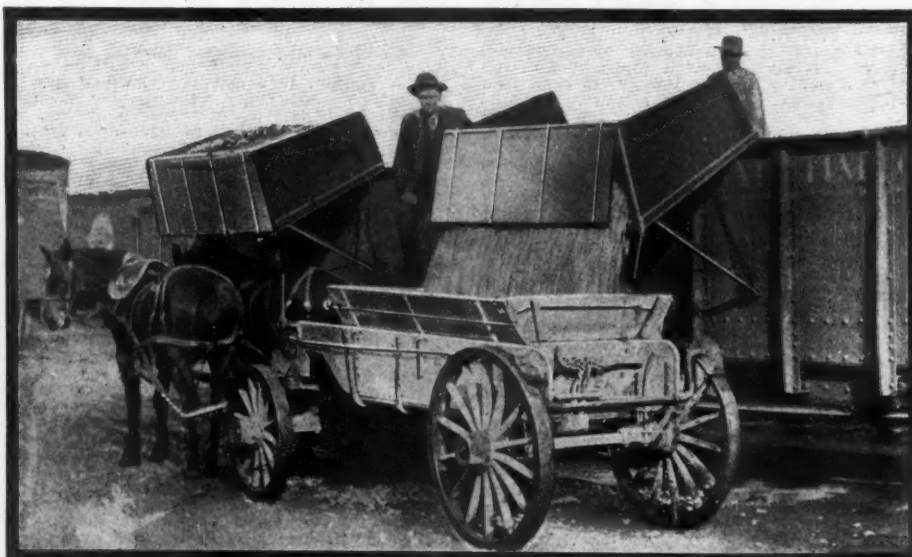
Successful Quick-Unloading Device

THE influence of the motor truck in speeding up service and efficiency is plainly seen in the recent adoption by teaming firms using horse systems of some of the quick-loading devices which the motor vehicle has brought to the fore.

It only has been in recent years that the hopper type of wagon body has been adopted by teaming firms which were hauling sand and building materials or doing excavating work, it being recognized as a great saving in the matter of unloading time, thus lessening the idle time spent by the team each day. The loading of these wagons has in most cases been by hand, however, thus making a waste at the beginning of each trip. Now come the quick-loading schemes to enable the contractor to fill his wagon in even less time than he can ordinarily unload it.

One of the more recent of the loading devices is the one shown in the illustrations, a hopper device that fastens to the side of a freight car, or the like, with adjustable hooks. Into this chute the men on the car shovel while the wagon is away. When the wagon arrives and drives under the chute it is but the work of a moment to dump the contents of the chute into the wagon which is off immediately without long wait. C. L. Baker & Sons of Quitman, Georgia, using this device on short hauls, are doing work with one team and crew which formerly took three. The Morrow Transfer Co. of Atlanta unloaded a car of 106,700 pounds of coal with this device with three teams and four men in 5 hours, the haul being a $\frac{1}{2}$ mile and the cost \$8.50 as against a former cost for the same job of \$20.50, a saving of \$12.

If this saving is effected with horse systems there is a great future for devices of this kind in the motor truck field. The sooner the users of motor trucks come to realize the importance of eliminating idle time and learn to keep their truck moving, the sooner will the commercial motor vehicle come into its own.



WHEN WAGON RETURNS HOPPER DISCHARGES LOAD BY GRAVITY



Legal Lights and Side Lights

DECISION AS TO STATE AID

THE attorney general of Wisconsin has given a decision to the Wisconsin highway commission that no part of the annual appropriation of \$300,000 to be distributed as state aid for highway construction and improvement can be used for rental or purchase of road building machinery, scrapers, oilers, or other appliances. The decision says that a dollar's worth of work must be executed for every dollar's worth of state aid rendered.

The decision settles a most interesting and equally important question which has arisen in many counties that are availing themselves of state aid. Large purchases of machinery were intended on the supposition that state aid moneys could be used for the purpose. In case contracts are made for certain highway construction by a township or county, separate specifications shall be made for rental or wear and tear of machinery used by the contractor. One of the real virtues of the ruling is that the county which fails to provide suitable road machinery will have no advantage over counties that do so provide.

NEW YORK RACING THREATENED

New York state organizations are watching the progress of the bill introduced by Senator McManus at Albany intended to stop racing in the state. The bill has passed its second reading. Charles T. Terry, representing the Automobile Dealers' Association, Inc., and the American Automobile Association, reports that the senate has sent it back to the committee for a public hearing. The Dealers' association has sent notice to the Manufacturers' Contest Association and to the directors of the Long Island Motor Parkway, as well as to those interested in the Riverhead race, calling attention to the terms of the bill. It is inspired by the accident at the Syracuse races last year. The bill prohibits racing on both highways and private courses.

SEEK ROAD LEGISLATION

Senator Murtaugh proposes to amend the New York state highway law. If his measure succeeds it will mean the general improvement of the road from Syracuse to Binghamton, much used by tourists. There are now several bad stretches in this route, though others are already improved or authorized to be through state appropriations.

Senator Murtaugh, who lives in Elmira, seeks to improve 1,200 miles of roads which connect existing sections that have been built on the state routes. It is not intended to do permanent construction, but to put and keep the roads in good condition. The smallest amount the state

highway commission can expend is \$100 a mile, while the towns through which the roads run are required to pay \$50 per mile. This can be increased by the state highway commission according to the needs of the road.

TESTING NEBRASKA LAW

The Nebraska motor law was tested in a suit which was tried in the Nemaha county court. L. L. Coryell, of Auburn, was charged with having violated the law in allowing his son, Leland, a minor,

Illinois' Tag Confusion



ILLINOIS DEALERS' TAG

DUPLICATION of numbers by the secretary of state promises endless confusion in Illinois this year. Complying with the law which calls for the tags issued to manufacturers and dealers being of a different shape than those handed out to owners, the secretary has simply clipped the corners off the trade tags. That wouldn't be so bad, but on top of this he has duplicated numbers, giving Chicago dealers low numbers under 150 which also have been issued to owners. The public is supposed to know that when the corners are clipped that the tag belongs to a dealer, and vice versa. The public does not know this, and, even if it did, it is almost impossible at any distance to see whether or not the corners are clipped because the background of the tag is black. In New York state, for instance, the secretary of state puts a letter "M" on trade tags, which saves confusion.



NEW YORK DEALERS' TAG

under 16 years of age, to drive a car, also that the boy drove past a wagon driven by Dewey Whitmore without warning the driver of the approach of the car, or giving him an opportunity to drive to the side of the road, and that instead of driving the car 30 feet past the team before turning into the road, he had turned in such a way that the car struck the side of one of the horses. The jury found Coryell guilty on all three counts and he was fined \$5 on each. Notice was given of an appeal.

DENVER'S GARAGE ORDINANCE

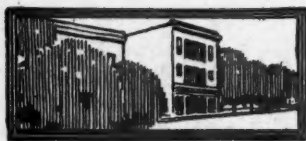
A new city ordinance recently introduced in Denver, Colo., by the building department before the municipal legislative bodies, the terms of which impose severe restrictions upon repair methods in the garages, is the subject of lively discussion by the dealers and other interested parties here. The principal objection is against the clause which provides that no furnace, torch, heating plant, or fire of any sort may be permitted in a place used for the storage of motor cars in constant service. Since in another clause which defines a garage as any place where a motor car is kept for any period of time Denver tradesmen maintain that should the ordinance become effective it will be necessary to repair machines on the street, for open flames are essential in curing some motor ills.

The measure also provides that no motor cars may be stored in the basement of a building any part of which is devoted to the storage of cars. This restriction is caused by the fact that the basement is the only part of the building in which heating apparatus may now be placed and the ordinance aims to prevent the keeping of machines on the same floor of the garage with heating plants. The dealers assert, however, that the walling-in of the heating apparatus is ample fire protection.

In another clause the ordinance provides that on the approach of a motor car to the building used for its storage, lights on and all fires in the vehicle shall be extinguished within 10 feet of the threshold. Similarly, there shall be no light on or fire in a motor car departing from its garage until the motor car be within 50 feet of the doorway. The proposed enactment does not say to which side of the entrance these rules are intended to apply—to the street side of the threshold or the interior side—and in consequence the dealers are at a loss to know just how the ordinance would be construed if it should go into effect.

Owners are much concerned about another section of the same document which makes it necessary that a property owner shall secure the consent of 50 per cent of the other property holders in his block before he can be granted a permit to erect a storage place for his motor car. It is said that fire seldom originates in one of the private garages, and that when it does it may be easily confined to the same structure; thus this provision of the ordinance is regarded as unjust and altogether needless.

Motorists claim that the ordinance is the work of some one unfamiliar with the motor car and its needs, and demand it be modified.



Among the Makers and Dealers



JANESVILLE Wants a Show
The Rock County Automobile Dealers' Association will give a show at Janesville on March 14, 15 and 16. Twenty-seven makes will be shown.

Heavy Imports of Hides—Increased receipts of hides from Central and South America at New Orleans is due to the increased consumption of leather in the motor car industry, according to New Orleans commission men.

Little Adds to Plant—The Little Motor Car Co., of Flint, has taken over the motor car business of the Flint Wagon Works, according to information that has been received in Detroit motor circles. Hereafter the latter will confine itself to the manufacture of horse-drawn vehicles.

Merged with Parent Concern—The Chicago Brass Co., a subsidiary of the American Brass Co., has officially gone out of business, and the Kenosha works are now officially known as the Kenosha branch of the American Brass Co. Important extensions are contemplated by the parent company at the Kenosha plant.

Seattle Experiencing a Boom—During the past 6 months the car selling business in Seattle has gone forward with tremendous strides. No fewer than six new agencies have been established and other firms have been transacting an unusually heavy volume of business. With the recent acquisitions, the Seattle row comprises practically all the leading American-made cars.

A. O. Smith Engineers Organize—Engineers employed by the A. O. Smith Co., of Milwaukee, pressed steel frames, motors, complete cars, etc., have organized an engineering society for the study of engineering practice and to promote cooperation with and loyalty to the concern. W. Metz was elected president and A. M. Stern is secretary. The society has a membership of twenty-eight.

Dealers Change Officers—E. A. Young of Bloomington has resigned the position of secretary-treasurer of the Illinois branch of the National Association of Automobile Dealers. L. F. O'Donnell of Jacksonville was chosen secretary and Julius Broehl of Pana was elected treasurer. The executive board is composed of L. F. O'Donnell of Jacksonville, chairman; James G. Parker, Maroa; Julius Broehl, Pana; Homer W. Wilson, Carlinville, and E. A. Young of Bloomington.



CHALMERS' TRAVELING EDUCATIONAL EXHIBIT

As a result of the selection of Mr. O'Donnell as secretary, it was decided to make Jacksonville the state headquarters of the Illinois branch.

Heaslet Back with Studebaker—James G. Heaslet has resumed his position as chief engineer of the Studebaker Corporation. For several months Mr. Heaslet has been working in independent experiments and inventions.

Canadian Gramm Company Formed—The Gramm Motor Truck Co. of Canada, Limited, has been authorized to do business in the province of Quebec. The powers conferred on the company by its charter are limited to those granted to corporations of a like nature, created in virtue of the laws of the province of Quebec, and subject to the formalities prescribed by the laws now in force in that province. Its chief place of business in the province is at Montreal.

Busy at Lee Factory—The Lee Tire and Rubber Co. of Conshohocken, Pa., announces that it has contracted to sell its output of 1912 already, and that measures are being taken to increase the plant so that the output for next year will be 800 tires a day. An additional issue of preferred and common stock has been determined upon and it is announced that the common stock offered was all subscribed for at par by present stockholders. The remainder of the issue is 7 per cent cumulative preferred. Announcement is made that the

Lee company has taken over the Arrow Tire Co. of William Penn, Pa., and has changed the name to the Leeland Tire Co., calling the product Leeland tires instead of Arrow.

Another Ford Assembling Plant—Announcement is made in Los Angeles by Manager Graves of the Ford branch there to the effect that an assembling plant will be erected on East Seventh street, Los Angeles. The plant is to cost \$250,000.

Sudrow Promoted —Flavius G. W. Sudrow, former manager of the Detroit branch of the Apple Electric Co., of Dayton, Ohio, has been made sales manager of the company and will be located at the factory in Dayton after March 15.

Big Ford Shipments—The Ford Motor Co. probably established a world's record for a single shipment last Thursday, when 302 model T's left the shipping docks in Highland Park in two solid trainloads.

The shipping force worked until late into the night to establish this new high mark. These 302 cars were followed by 300 more Friday.

New Oakland Branches—The Oakland Motor Car Co., of Pontiac, has just opened branches in Atlanta, Ga., Kansas City, Mo., and San Francisco. The territory covered by the Atlanta branch includes nine states, viz.: Mississippi, Louisiana, Alabama, North Carolina, South Carolina, Georgia, Tennessee, Arkansas and Florida. The Kansas City branch covers the states of Missouri, Kansas, New Mexico and Texas, while the San Francisco branch takes in Nevada and northern California. The new branch managers are: Morgan Morgans, Atlanta; Henry L. Hornberger, San Francisco, and T. N. Shambaugh, Kansas City.

Chalmers' Educational Campaign—The Chalmers Motor Co. has just sent on the road an educational exhibit. As the illustration shows, this exhibit consists of seventy-five or 100 of the various parts of Chalmers cars. A demonstrator, who accompanies the exhibit, gives a very comprehensive talk on the methods of car manufacture, illustrating particularly the methods by which Chalmers cars are tested. One feature of the exhibit is a set of scales upon which the demonstrator illustrates the perfect balance of motor car construction, balancing cylinder against cylinder, connecting rod against connecting rod, and so forth. The exhibit

also includes a complete set of test gauges which are used in the Chalmers plant. At the Boston show this exhibit was shown for the first time.

Avery Will Enlarge Plant—A general enlargement of the truck factories at the Avery Co. plant in Averyville, Ill., will be authorized during the present month.

Organizing in Racine—Motor car dealers of Racine, Wis., are organizing an association patterned after the Milwaukee, Oshkosh, Madison and Janesville associations. It is probable that a local show will be held here before spring.

Detroit Has 200 Agents—The Briggs-Detroit Co., one of the infants in the Detroit motor car industry, inasmuch as it started doing business only 3 months ago, already has closed contracts with over 200 dealers, scattered over a wide territory.

Adding to Universal Joint Plant—The Blood Brothers Machine Co., manufacturer of universal joints at Kalamazoo, Mich., is running both night and day shifts. Since last September it has put up several new buildings and added new equipment until its capacity is nearly doubled over what it was at that time.

Denver Dealers Interested—Feeling that there are many important questions frequently arising concerning trade of Denver which should have united consideration by the local dealers, a permanent organization of the Denver agents and branch managers has been perfected. The body will be a branch of the Denver Retail Merchants' Association, of which many of the dealers are already members. George Collisson, secretary of the general association, was made secretary of the sub-

sidary organization. Tom Botterill, Denver representative of the Pierce, Hudson and Columbus, was chosen permanent chairman.

Birmingham Dealers Organize—A permanent organization of the dealers of Birmingham, Ala., has been formed, the following officers being chosen: D. A. Greene, president; H. A. Dronnen, vice-president; E. W. Brownell, secretary; Leo Loeb, treasurer.

Winton Branch in Canada—With the establishment of a factory agency in Vancouver, B. C., the Winton Motor Carriage Co. of Cleveland is now prepared to wage an active campaign for business in British Columbia and other Canadian provinces. The branch will be operated on the same policy as the factory houses in Tacoma, Seattle and other points.

Chicago Trade Election—The annual election of officers of the Chicago Automobile Trade Association was held Monday, and the following ticket was elected without opposition: N. H. Van Sicklen, president; Charles M. Hayes, vice-president; Henry Paulman, treasurer; H. N. Fowler, secretary. Directors elected for 1 year are C. M. Garrett, F. A. Groves and L. E. Burr; and those elected for 2 years are A. W. Moore and H. C. Tillotson.

Interested in Edwards' Company—The various commercial organizations of Indianapolis are making a renewed effort to sell sufficient stock in the Edwards Motor Car Co. to obtain the concern's proposed new factory for Indianapolis. A committee consisting of representatives of six commercial organizations has the stock selling campaign in charge. C. G. Stoddard of the company was in Indianapolis

on the evening of March 5 and addressed about 100 business men in the Board of Trade building concerning the new company.

Will Make Cheap Car—Elmer K. Smith, of Detroit, is organizing a company to manufacture a low-priced car of the type of the Hupmobile. It is reported that southern capital is interested in the enterprise and is prepared to back it strongly.

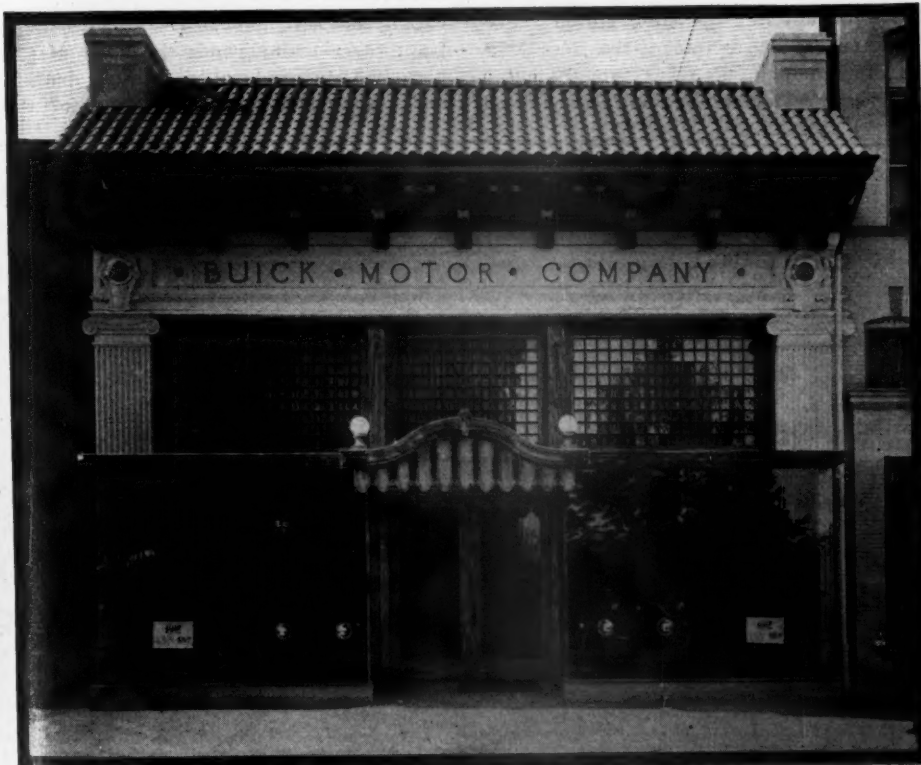
Underwrite Gramm Stock—Through an arrangement with Geiger, Jones & Co., of Canton, the Gramm Motor Truck Co., of Lima, O., has secured the underwriting on half of the million dollars' worth of stock of the company which has remained unsold. The money received from the underwriting will be used to increase the facilities of the plant.

Becker in Truck Deal—The Krebs Commercial Car Co., of Clyde, Ohio, recently incorporated to manufacture motor trucks and delivery wagons, has been organized by the election of the following: B. A. Becker, president; George Slessman, vice-president; Homer Metzgar, secretary; R. B. Jones, treasurer; J. L. C. Krebs, general manager; and Frank X. Bachle, superintendent. Several of the company's officials were formerly connected with the Elmore company of Clyde, Ohio.

Windshield Drawback Allowed—The treasury department at Washington has instructed the collector of customs at Chicago to allow, on the exportation of windshields manufactured by the Garage Equipment Co., of Milwaukee, Wis., in part from imported plate glass, a drawback of duties paid on the imported glass. The allowance of drawback shall not exceed the quantity of glass actually contained in each windshield exported, there being no allowance for wastage.

Washington Directorate News—The Washington Motor Car Corporation, which has succeeded the Carter Motor Car Corporation as the maker of the Washington car, has increased its directorate from twenty-nine to forty-five members. The new additions to the directorate are Wilton J. Lambert, J. C. Wineman, Charles J. Cassidy, E. M. Terry, Dr. A. V. Parsons, Dr. E. A. Gorman, Ralph Bricker, H. Brown, W. D. Arrison, A. Gary Carter, H. H. Koehler, Otto Koehler, W. S. Carter and H. O. Carter.

Fond du Lac Organizes—The Fond du Lac Automobile Dealers' Association has been organized at Fond du Lac with the following officers: President, E. W. Clark; vice-president, R. H. Lee; secretary, Edwin G. Mitchell; treasurer, W. C. Reinig. The association has a charter membership of fourteen firms. Arrangements are now being made for a show. The tentative dates are March 29, 30 and 31 and April 1. The fourteen members of the association represent twenty-nine different makes of cars and all will exhibit. E. F. Cooper is manager of the show.



BRANCH OF BUICK MOTOR CO. AT WASHINGTON, D. C.

Development Briefs

Little Things of Interest to the Motorist—New Automatic Road Guide—Portable Sheet-Metal Garages—Metal Air Hose—A Novel Priming Device—Dynamometer for Testing the Power of the Engine

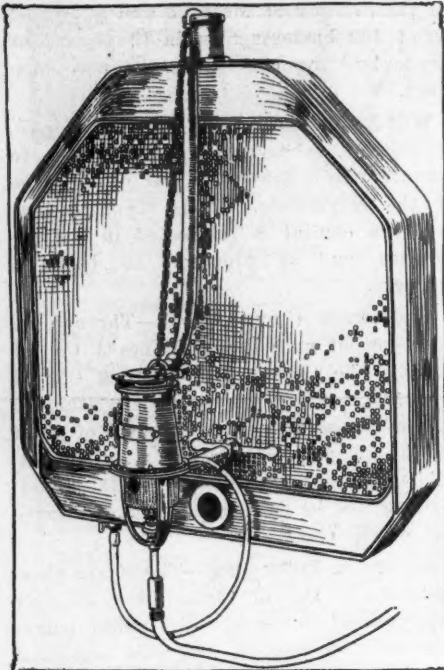


FIG. 1—NEVEROUT RADIATOR HEATER

Home Starter and Electro-Liter

COMBINING an acetylene starting system with an electric gas-lighting system has been accomplished in the Home starter and Electro-liter illustrated in Figs. 2 and 3. It is made by Home Light Co., Chicago. The starting device is a low-pressure acetylene system comprising a diaphragm gas regulator which is an automatic reducing valve, a distributing valve and gauge on the dash and injecting connections in the cylinder heads and the intake manifold. Gas flows from the rotary distributing valve on the dash to the cylinders through shut-off cocks. All of the cocks are opened and closed by a movement of a lever extending through the dash. Pushing the rod forward opens the cocks and at the same time releases any compression in the cylinder so that the gas which is under

low pressure can enter the cylinders and mix with the air. The cocks are closed by pulling the rod backward and the engine started on the spark in the usual manner. By turning the rotary valve so that gas flows into the intake manifold, the engine can be run on acetylene until the regular gasoline supply is drawn through the carbureter. The nipples extending down into the cylinder heads and through which gas is taken into them have a 1/8-inch steel tube which injects gas in a direction to give the correct mixture. This starter is designed in a special form for the model T Ford engine in which case the outfit is furnished complete with a new cylinder head drilled and tapped and fitted with cocks and rods all assembled so that no soldering, threading or cutting of tubes is necessary.

The Electro-liter system is illustrated at the left in Fig. 2 and is simply a small attachment connected with the gas tank, wiring and piping originally on the car. It is arranged to light, control and extinguish the gas lights from the driver's seat. The regular high-tension ignition current from one of the spark plugs is diverted to special spark gaps on the burners until the gas is ignited.

Neverout Heater

To prevent damage from frozen radiators and cracked cylinders the Rose Mfg. Co., Philadelphia, Pa., has brought out a gas heater which can be hung on the front

of the radiator and connected to the cooling system to keep the radiator and motor warm when in the garage. When the car comes in at night the tube of the heater is hooked in the radiator filler opening, the heater circulating system connected with the radiator pet cock by means of a small rubber tube and the burner connected with the city gas supply. It is claimed that a garage of ordinary size can be kept comfortably warm with the heater in use at an expense of about 2/5 cent an hour. It is illustrated in Fig. 1.

National Gasoline Gauge

To show the exact number of gallons of gasoline in the fuel tank at any time the National gasoline gauge, illustrated in Fig. 4, should be useful. It consists of a float in the tank which is connected with an indicating hand and dial on top of the tank. It is adjustable and will fit any depth of tank up to 12 inches. It is very easy to install and fit under any seat. It is manufactured by the National Motor Supply Co., Cleveland, O.

Hayes' Tool and Battery Boxes

In the tool and battery boxes made according to the Hayes' method of construction, all covers are pressed into shape with round corners of 1-inch radius. These corners are then annealed to prevent splitting; the sides and ends are made of one piece with a bead rolled into the bottom and top to straighten the center of the

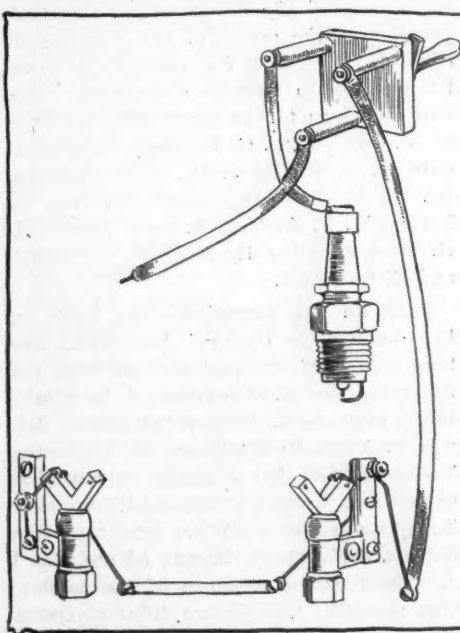


FIG. 2—ELECTRO-LITER SYSTEM FOR ACETYLENE HEADLIGHTS

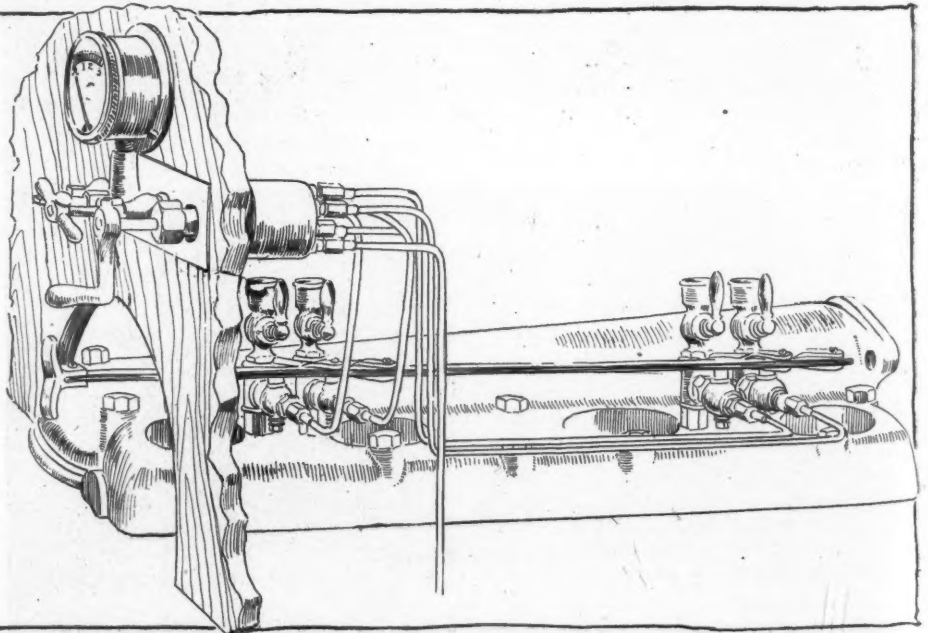


FIG. 3—HOME ACETYLENE STARTER DESIGNED SPECIALLY FOR INSTALLATION ON MODEL T FORD CARS

Novelties for Motoring

Acetylene Starter for Ford Cars—Electric Gas-Lighting System—Neverout Radiator Heater—Gauge for Gasoline Tank—Quick Method of Body Finishing—Window Regulator for Closed Cars

box, afford a rest for the cover when closed and enhance the appearance of the box as a whole. The seam at the back is lapped and offset and all joints are welded electrically. Aside from being one of the pioneer makers of metal tool and battery boxes, the Hayes Mfg. Co., Detroit, Mich., is a large builder of metal bodies, fenders and other sheet-metal parts.

New Window Regulator

An improvement offered in connection with the interior finish and equipment of closed bodies is the Perfect window regu-

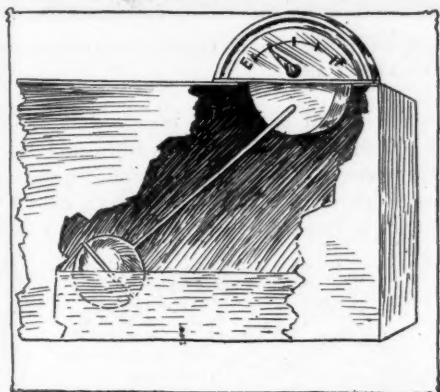


FIG. 4—NATIONAL GASOLINE GAUGE

lator, a device for raising and lowering the windows in motor cars and doing away with the objectionable features of the strap commonly employed. The raising and lowering of the window is accomplished by simply turning a handle and the window is held in any desired position. The arrangement is illustrated in Fig. 5, and provides a positive lock for the sash, as it is impossible to open it from the outside. The construction consists of a cam plate attached to the lower frame of the sash, two ball-bearing sockets connected by means of an adjustable spacing bar and a cam roller on the chain. The two sprockets are rotated through a special chain by turning the handle on the inside of the door. At one point on the chain is attached a spindle and cam roller engaging with the cam plate which carries the sash. It is manufactured by the Perfect Window Regulator Co., New York.

W-S System of Body Finishing

The paint shop has always been one department of the motor car factory or repairshop which has had a tendency to delay the work, because the ordinary system of finishing motor car and carriage bodies has required from 18 to 26 days for the best class of work. The Standard Varnish Works, Chicago, has produced a

method of body finishing with the use of its varnishes which is called the W-S system, and with which the work can be completed in from 9 to 16 days, depending upon the grade desired. The saving of time is effected by the elimination of all rough-stuff coats and also by omitting some of the color coats. In place of the many coats of rough-stuff, the W-S system calls for one single coat, which is called the facing, or sealing, coat. This system can be applied on metal bodies of all kinds and chassis parts, as well as wooden bodies.

Flexible Metallic Tubing

The short life of rubber tubing in motor car service has resulted in the application of the flexible metallic hose to lamp tubing and air hose for tires. The lamp tubing employs the interlocking principle which has been a feature of Pennsylvania metal hose for some time. The air hose is made of galvanized steel covered with a fine wire lacing. The chief advantage of this metallic tubing is that it will not become porous and is not affected by oil or gasoline. The air tubing is fitted with standard pipe coupling and acorn connections. It is a product of the Pennsylvania Flexible Metallic Tubing Co., Chicago, and is illustrated in Fig. 6.

Rapid Repair Enamel

One of the most useful preparations recently offered for the man with a car is the Whiz Rapid Repair enamel for concealing the disfigurements which would mar an otherwise beautiful car. It may be used on metal or upholstery and dries within 5 minutes to a hard waterproof



FIG. 5—PERFECT WINDOW REGULATOR

surface. For touching up the body enamel it saves many trips to the paintshop and consequent idleness of the car. It is a product of the R. M. Hollingshead Co., Camden, N. J.

Sharp Spark Plugs

A new idea in spark plugs is known as the Sharp plug, a product of the Sharp Spark Plug Co., Cleveland, O. The metal shell of this plug is hollow and forms a gas chamber inside of the plug. There are two narrow slots across the bullet-shaped nose, through which the gas is forced by the compression stroke of the piston into the gas chamber inside of the plug. It is claimed that the Sharp nose cause a concentration of heat at the firing point and that as the gas is forced through this extreme heat it ignites more readily than does the gas in the cylinder. When the gas inside the plug chamber is ignited the flame is shot through the four slots in the nose into the midst of the gas in the cylinder, resulting, it is claimed, in

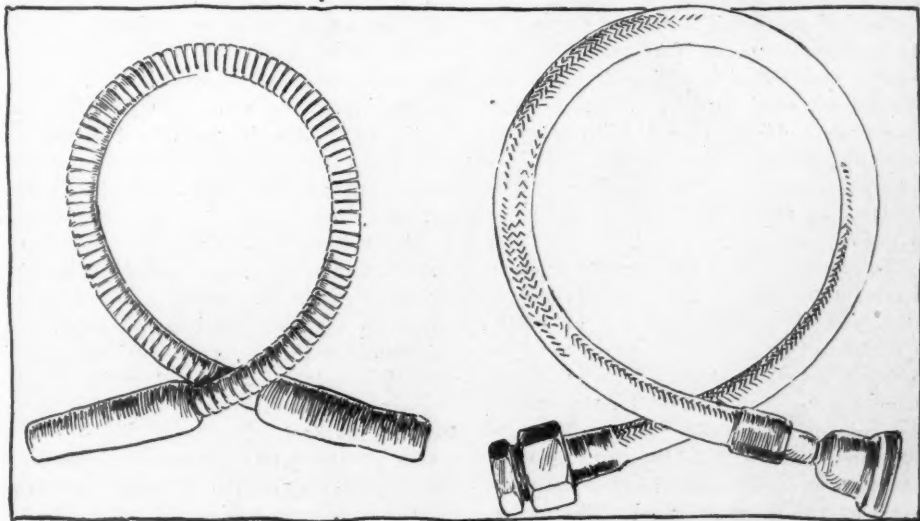


FIG. 6—PENNSYLVANIA FLEXIBLE METALLIC TUBING FOR GAS AND TIRE-PUMP CONNECTIONS



FIG. 7—CHADWICK ROAD GUIDE SHOWING DIAL AND INDICATORS

the very rapid flame propagation with an increase in engine power. It is also found that the shooting of this charge of gas through the nose of the plug with each ignition scours the sparking points and prevents fouling.

Chadwick Automatic Road Guide

A road guide that performs the functions of directing the motorist and furnishing information as to approaching road conditions automatically is the Chadwick safety automatic road guide, invented by L. S. Chadwick, of Bantam, Conn. This instrument consists of a dial fitted with a set of signals which indicate road conditions and directions.

It is attached by flexible shaft and gears to the front wheel in just the same way as a speedometer. The construction embraces a set of signals which are operated by compressed air, the signals being thrown up when holes punched in a paper disk coincide with the air tubes. The method of operation is similar to that of the pneumatic piano players. The perforated record disk is arranged to give notice of all road directions, speed traps, rough roads, danger points, railroad crossings, and so on. There is a set of ten different signals of different colors. These are large enough to be seen from any point in the car and at any speed.

The instrument is fitted with a small electric light inside the case, making it possible to follow the signals as easily at night as by day. The distance that the signals are to fall ahead of the road condition can be instantly set by the driver. The records are made from thin white fiber and can be quickly changed with the hands and each contains directions for a trip of 100 miles or under. The names of towns, hotels, streets, and other items of interest are printed on the face of the

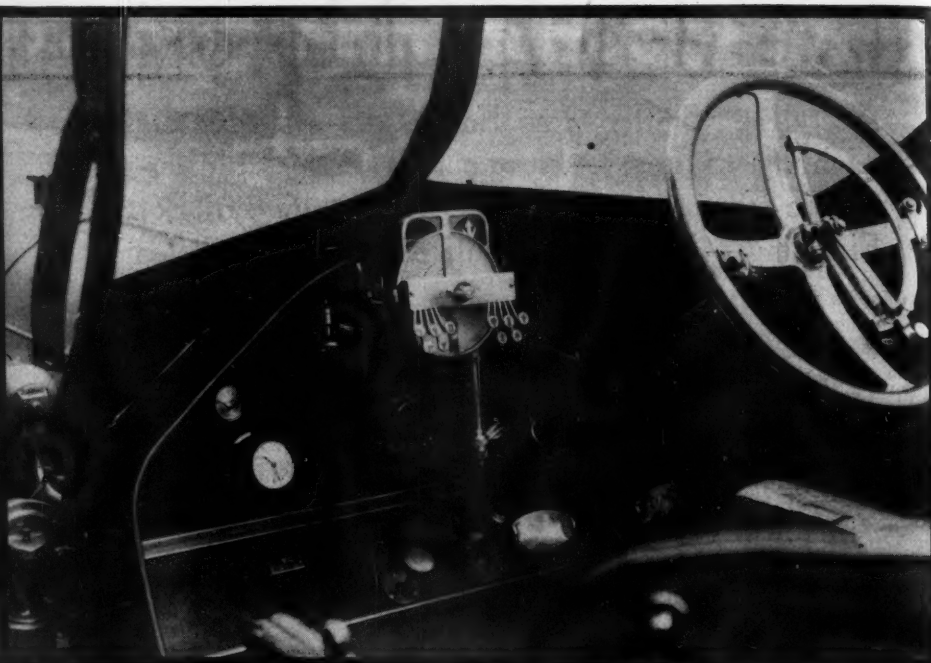


FIG. 8—CHADWICK AUTOMATIC ROAD GUIDE WITH RECORD-MAKING ATTACHMENT AS INSTALLED ON THE DASH

record at points corresponding with the mileage. As each signal is thrown a bell inside the case is sounded to notify the driver that there is a signal up for his instruction.

The road records furnished at this time cover the most of the eastern states, but it is intended within a few months to cover the more prominent routes all over the country with the automatic records. For those who desire to make their own records and thus preserve a permanent record of their tour with road directions for succeeding trips, there is supplied a record-making attachment. This consists of a keyboard bearing the ten signals with which the disks may be punched on the tour. To make such a record a blank disk is placed in the instrument and the car driven over the road upon which the record is to be preserved. If it is desired to make a complete master record, careful notes of the trip should be made, but for ordinary use the note-book can be dispensed with and the keyboard of the instrument relied upon. The driver or his companion can make perforations, in the record by the use of the character buttons or keys. To make the perforations simply slow the car down to about 20 miles per hour and press the proper button quickly when just at the point of change in direction or at danger points. The instrument with its record disk is illustrated in Fig. 7. The installation of the instrument with the record-making attachment is illustrated in Fig. 8, while Fig. 9 shows a complete record of a 100-mile trip.

Mondex Muffler

One of the latest constructions in exhaust silencers is the Mondex mufflers marketed by the Aristos Co., New York. The chief features of the new muffler are the very small size and the very high

efficiency that is claimed for it. It is said to operate without back pressure and the arrangement is such that it cannot become sooted or choked up. The design of the muffler is illustrated in Fig. 10. The pipes

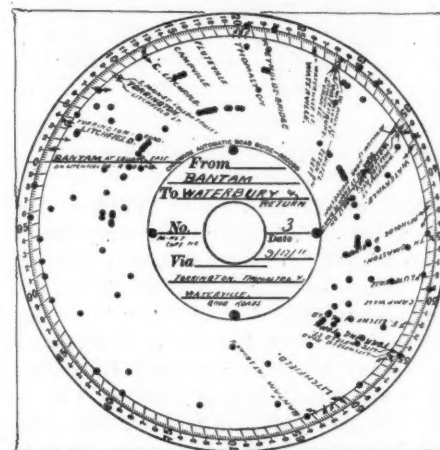


FIG. 9—A CHADWICK RECORD

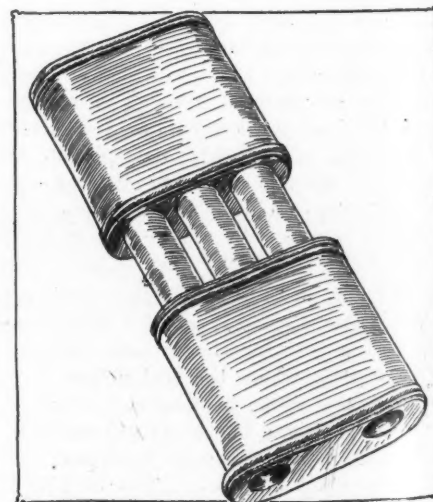


FIG. 10—MONDEX MUFFLER

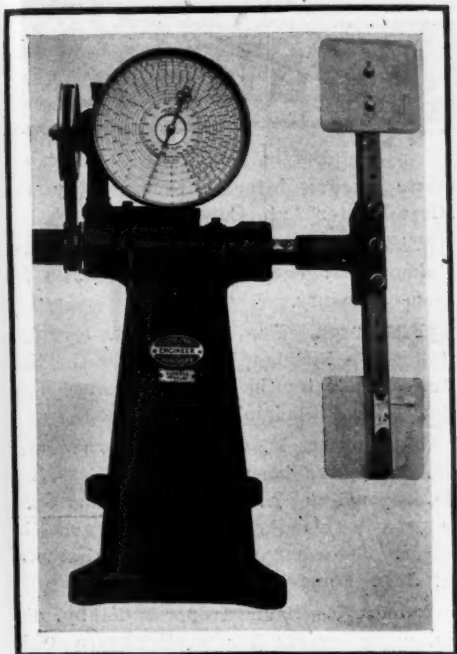


FIG. 11—TRACY FAN DYNAMOMETER

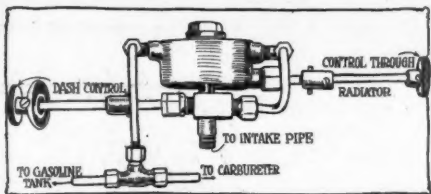


FIG. 12—AUTOMATIC MOTOR PRIMER

are seamless drawn steel tubing held together by steel bands shrunk on the end chambers. It is said to take up about one-half the space of the ordinary muffler.

Grinnell Rist-Fit Gloves

Among motoring accessories one of the most widely used features of equipment is the motorist's gloves. The Morrison-Ricker Mfg. Co., Grinnell, Ia., is producing a motor gauntlet which is distinctive. This is known as the Grinnell glove, and its best-known features are the patented wrist-fit and the ventilated back. A little V of soft leather inserted in the cuff allows the glove to be drawn snugly about the wrist, holding the gauntlet up and excluding wind and dust. Through tiny rows of perforation across the back of the hand and fingers ventilation is assured by a current of air so that the hands are kept cool in hot weather.

Golde Patent Top

A motor car top which has the feature of being quickly opened and closed, even when the car is in motion, is the Golde patent top, marketed by the Golde Patent Mfg. Co., New York. The design is such that one person can operate it with ease. This top is widely used in Europe.

Valentine Vanadium Chassis Finish

By a new process of manufacture the chemists of Valentine & Co., of New York, have produced a varnish for motor car work of such hardness that it is said to resist absolutely the destructive action of soaps, mud, grease, etc., and retain its

luster for an exceptionally long period. It is produced particularly for chassis finishing and for the hoods, fenders, and so on. This is called vanadium chassis finishing, and is a very heavy body varnish possessing excellent working and flowing qualities. It is said to dry in from 2 to 3 hours and harden ready for use within 2 days.

Fan Dynamometer

A dynamometer of the fan type designed especially for the absorption and measurement of power developed by gas engines is the product of Joseph Tracy, of New York. The standard type of dynamometer is illustrated in Fig. 11 and consists of a metal pedestal carrying a horizontal steel shaft, one end of which is connected with the motor under test through a universal joint and the other end a two-bladed fan. On the dynamometer shaft a small pulley at the rear of the universal joint is belted to a larger pulley on a special tachometer or speed indicator. The dial of this instrument has an inner scale showing the revolutions per minute and six outer scales showing the horsepower developed. These scales correspond to the positions in which the fan blades may be secured. By this arrangement a simultaneous reading of the speed and power developed can be obtained without computation or the use of a reference table. This is employed in several factories.

Pruden Metal Garages

Portable fireproof buildings are one of the products of the Metal Shelter Co., St. Paul, Minn. Although portable, there is nothing temporary about them and the construction complies with the most stringent requirements of building ordinances or insurance companies. The construction is accomplished by assembling unit parts. By ingenious structural methods the siding, roofing, ridges and so on, are made to so interlock and support each other that framing is avoided. Siding and roof units are interchangeable so that the work of

erecting is simplified. The result accomplished is a building in knock-down form which may be erected without skilled labor and at small cost. The material is galvanized sheet steel and interior lining may be easily applied if desired. Fig. 13 illustrates one of these metal garages.

Valve-Grinding Compound

A special compound for valve-grinding is put up by the Rie Nie Mfg. Co., Minneapolis, Minn. This consists of a special abrasive put up in a cutting oil which is designed to stick to the valve seat. It is said to grind rapidly and with little work, leaving a smooth polished seat. For owner's use, the compound is put up in small cans in both fine and coarse grades; for shop use large cans are supplied in three grades of fineness.

Automatic Primer

A device so arranged that opening a valve on the dash it will automatically prime the motor without raising the hood and without the use of auxiliary tanks, air pressure or any pumping device, is called the Automatic primer, and is illustrated in Fig. 12. It will be seen that this can be controlled by push rod either from the dash or from the radiator and is connected by T connection in the pipe line between the carburetor and gasoline tank and also to the intake manifold above the carburetor. It draws gasoline from the tank and forces it into the intake pipe, thus cutting out the carburetor. This is made by the Automatic Priming Device Co., Chicago.

Whiz Waterproof Dressing

A special dressing for improving the appearance and rendering waterproof tops and cushions of motor cars is marketed under the name of the Whiz cushion dressing and made by the R. M. Hollingshead Co., Camden, N. J. It is designed for use on leather, pantasote or mohair and when dry is flexible, waterproof and will not peel off or soil the clothing.

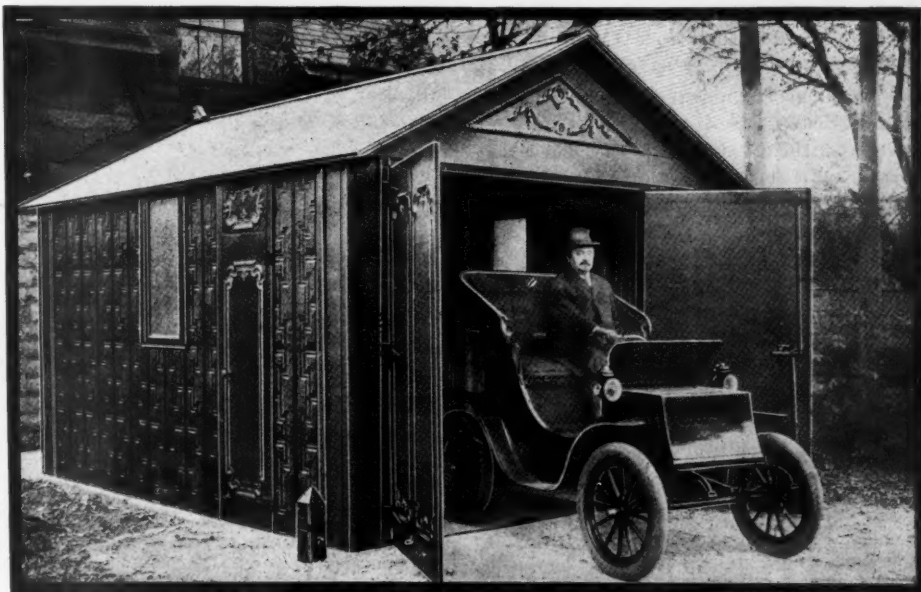


FIG. 13—A PRUDEN PORTABLE GARAGE

VINTON, O.—J. W. Hartsook has taken the local agency for the Ford.

Louisville, Ky.—The Reimers Motor Car Co. has taken the agency for the Ohio electric.

Postoria, O.—Henry J. Adams has become distributor for the Reo pleasure cars and motor trucks in northwestern Ohio.

Guthrie, Okla.—The Guthrie garage has been taken over by Galen Crow, who has a building 50 by 100 feet. W. J. Dibbens is associated with him.

Omaha, Neb.—The National Automobile Training Association is building one of the largest garages in the city at Twentieth and Locust streets.

Kenosha, Wis.—The Arthur Gardiner garage of this city has changed hands. Russell Brothers, formerly of Elgin, Ill., have purchased the business.

Columbus, O.—The John W. Brown Mfg. Co., maker of lamps, has filed papers with the secretary of state increasing its capital stock from \$125,000 to \$175,000.

Baltimore, Md.—The Columbia and Maxwell cars are now being represented in Baltimore and surrounding territory by the L. M. Vordemberge Motor Co.

Chicago—The Automatic Motor and Engineering Co., maker of the Automatic self-starting motor, has increased its capital stock from \$100,000 to \$125,000.

Baltimore, Md.—Norwood Brothers, Inc., with headquarters in the Continental building, are handling the Seitz and Lincoln cars in Baltimore and the surrounding territory.

Shreveport, La.—Henderson's garage, the largest in the state outside of New Orleans, has added the Velie to its line. W. K. Henderson, Jr., the owner, is also representative for the Ford in this territory.

Shreveport, La.—A garage is being erected on Travis street for William Lowe. Mr. Lowe formerly was in the garage and sales business here, but his plant was destroyed by fire some time ago and he has been out of business since then.

Philadelphia, Pa.—The American car now occupies the quarters vacated by the Gomery-Schwartz Motor Car Co. local agent of the Hudson, at the southwest corner of Broad and Callowhill streets. Ralph Earle is the manager of the local American agency.

Richmond, Ind.—The Westcott line for 1912 will be handled in Minneapolis, Minn., by T. M. Anderson, in St. Paul, Minn., by the Roller Motor Car Co.; in Greenville, Ohio, by H. H. Minnich; in the states of Oklahoma and Arkansas by the Westcott Motor Car Co., of Arkansas.

Pittsburgh, Pa.—The Palace Motor Car Co. is the latest car factory to locate in the Pittsburgh district. This concern, financed by Pittsburgh capital, will establish a plant in Rochester, Pa., 20 miles from Pittsburgh. The company will manufacture a 40-horsepower car with 118-

inch wheelbase. The car will be known as the Palace 40.

Tiffin, O.—C. G. Mayer & Son, Main and Ann streets, have taken the agency for the Krit.

Pittsburgh, Pa.—The Auto and Cycle Supply Co. has been opened at 12 West Stockton avenue by Walter G. Reineman.

York, Pa.—W. M. Laird, Pittsburgh, will handle the line of Pullman cars in the Smoky City and western Pennsylvania.

York, Pa.—A garage and general machine repairing shop has been opened by J. M. Bush, at the corner of North George street and Ninth avenue.

Seattle, Wash.—Don McKay has resigned from his position as manager of the Diamond Rubber Co. Mr. McKay has been succeeded by H. F. Mason of Los Angeles.

Indianapolis, Ind.—Shirley Deming, late of the Henderson Motor Sales Co., has taken a position as sales manager for the Cole Motor Co. at Denver, Colo. He is an Indianapolis man.

Minneapolis, Minn.—John T. Fisher has arrived at the Oldsmobile new factory branch, 635 Hennepin avenue, to systematize the service department and the handling of parts of which there is to be kept in stock \$30,000 worth.

Moline, Ill.—W. A. Peck, former western sales manager for the Midland Motor Co., has resigned his position and intends to take up farming. C. S. Mason has been appointed advertising manager and general publicity man for the Midland company.

Portland, Ore.—The sale of F. W. Vogler's interest in the Stearns-Knight Auto Co. to Charles A. Eastman is announced. The firm name of the company will be Steel & Eastman. G. A. Steel formerly was state treasurer of Oregon. Charles A. Eastman is president of the new concern and R. S. Wilson, sales manager.

Indianapolis, Ind.—The Morris Motor Sales Co., recently organized, will be incorporated in Indianapolis, where it will make its headquarters for the distribution of the Chase truck in Indiana. Members of the new company are C. O. Morris, Donald Morris, Paul H. Krauss, Sr., Paul H. Krauss, Jr., Fred Krauss and Otto Krauss.

San Francisco, Cal.—A. E. Hunter has sold his interests in the Osen & Hunter Auto Co. to O. C. McFarland, and the Osen-McFarland Auto Co. has been organized to handle the Mitchell car in northern California. The company has moved into new quarters on McAllister street, near Polk. Hunter retains the large salesrooms and shops on Golden

Gate avenue hitherto occupied by the Osen-Hunter Auto Co.

Tiffin, O.—Jesse W. Gray, of Ohio, has taken the agency for the Hupmobile for Seneca county.

Pittsburgh, Pa.—P. F. Bartley has taken the Pittsburgh agency for the batteries made by the Electric Storage Battery Co., Philadelphia.

Washington, D. C.—The Alpena Motor Sales Co. has been formed by E. Faber, O. A. Reed and A. I. Potter, to handle the Alpena in this city and Maryland and Virginia. The company will have salesrooms at 1312 Fourteenth street, N. W.

Toledo, O.—Baumgardner & Kibby, distributing agents for northwestern Ohio for Marathon and Detroit pleasure cars, and for the Cass motor truck, have outgrown their quarters and last week moved into larger rooms at 911-13 Jefferson avenue.

Chicago—The Findeisen & Kropf Mfg. Co., of Chicago, has secured the Hall Motor Supplies Co. of Toronto, Canada, as Canadian distributor of Rayfield carbureters. The R. C. Hull Electric Co., of Cleveland, O., is another new Rayfield agent.

Detroit, Mich.—Five new dealers have signed contracts with the Abbott Motor Co. They are D. B. Hoffer & Sons, Reading, Pa.; Heathman-Solliday Motor Co., Dayton, O.; John Deere Plow Co., Dallas, Texas; W. S. Bruce & Co., Memphis, Tenn., and Abbott Motor Sales Co., Toledo, O.

Madison, Wis.—Display rooms and sales headquarters for Rambler cars have been established here, in charge of Theodore B. Roach, president of the Copeland-Roach Motor Car Co., of Watertown, Wis., central Wisconsin distributor for the Rambler. T. A. Wondryka of Madison will be resident manager.

Detroit, Mich.—Frank Illenberger has discontinued his connection with the Colonial Steel Co. He will retain his office at 1517 Ford building, Detroit, where he will continue handling tool and alloy steels. He intends to add to this line sheets, plates and other steel commodities; also aluminum, brass and bronze castings made by Columbia Castings Co., Detroit, of which company he is president.

Buffalo, N. Y.—Neely & Ensor, of Baltimore, have taken the agency for the Lippard-Stewart delivery car. They also handle the Alco. Lippard-Stewart delivery cars are now being handled in Bridgeport, Conn., by the Edwin W. Jennings Co., which has the Stevens-Duryea. The Michigan Motor Co., of Portland, Ore., has taken the agency for Lippard-Stewart for the state of Oregon. The Whitten Motor

Brief Business

Announcements

Vehicle Co., of Providence, R. I., has the agency for the Lippard-Stewart.

York, Pa.—The Miller Auto Co., 308 West Mason avenue, has taken the agency for the Michigan.

Montreal, Que.—J. O. De Vaux, proprietor of the De Vaux garage, 3 Garnier street, has accepted the agency of the Detroit.

Chicago—The Velie Motor Vehicle Co.'s Chicago branch has closed contract with Albert Baie, of Hincley, Ill., who will sell Velie cars. His territory is DeKalb, Lee, Ogle and Kane counties.

Shreveport, La.—The Schmidt Motor Co. has applied to the parish board for a charter to engage in the manufacture of motors and motor car accessories. The company is capitalized at \$30,000.

Philadelphia, Pa.—The Auto Equipment Co., handling the Flanders electric, is about to occupy a new home at the northwest corner of Eighteenth and Market streets. In connection with the new store will be a service station and garage.

San Francisco, Cal.—Captain H. D. Ryus has been appointed manager of the Oldsmobile branch in Los Angeles, succeeding David L. Whitford, who has resigned. Ryus lately has been sales manager for W. R. Ruess, Pope-Hartford agent in Los Angeles.

Cincinnati, O.—A. E. Reid, 280 Madison avenue, Toledo, Ohio, will represent the Cino in northwestern Ohio and southern Michigan. Charles F. Batt, 1378 Bedford avenue, Brooklyn, New York, has the sole selling agency for the Cino on Long Island and the vicinity of New York.

Shreveport, La.—The Gardner Carburetor Co. has finished the construction of its concrete buildings, to be used for machine shop and frame pattern shop. Machinery is being installed now and the new company expects to begin the manufacture of carburetors of the Gardner type in the next few weeks.

Denver, Colo.—The J. I. Case display room at 1236 Broadway was formally opened last week. Heretofore the Case company has carried its whole line at its warehouse in the lower part of the city, but the new location of its car department is in the heart of the new row. A. H. Renard is the Denver branch manager.

San Francisco, Cal.—Rene J. Marx, for several years past manager of the Pacific coast branch of the Renault, has resigned to become manager of the Simplex Pacific coast agency in northern California and the northwest. John N. Burge, the retiring manager, becomes general outside traveling representative of the Simplex company. E. Willman has arrived

here from New York to take charge of the Renault branch.

Indianapolis, Ind.—Robert E. Hosea has become general manager of the McCullough Motor Supply Co.

Toledo, O.—The Moore Truck Co. has increased its capital stock from \$10,000 to \$200,000, to provide for additional facilities in its plant.

Anderson, Ind.—The Remy Electric Co. has established a new service station in Grand Rapids, Mich., the Lamb Electric Co. being the connection in this place.

Portland, Ore.—The Southern Oregon Automobile Co. of Klamath Falls has opened a new garage 60 by 150 feet which will be known as the White Pelican garage.

Peoria, Ill.—The Graham-Seltzer Co., 1201-22 Main street, has taken over the supply business of M. M. Baker & Co., 625 Main street. Baker will continue selling cars.

Pittsburgh, Pa.—The Pittsburgh Chalmers Co. has let the contract for a four-story reinforced concrete garage and salesroom to be erected in Schenley farms, opposite Forbes field.

Cincinnati, O.—C. E. Jacques, Berlin, Ont., has been given the selling agency for the Cino motor cars in Berlin and vicinity. William Haberer has been made city sales manager for Cino cars in the city of Cincinnati.

Milwaukee, Wis.—A. R. Meyer has leased the Walsh garage, 188-192 Eighth street, and will operate a general agency, garage and repair business. Space has been sub-leased to L. A. Shippy of Chicago, representing the Little Giant 1-ton motor truck.

Fond du Lac, Wis.—The Duplex Coil Co., manufacturing ignition devices, coils, dynamos and electric lighting systems for motor cars and boats, has decided to move from Fond du Lac, Wis., to Bay City, Mich., in order to be nearer the market, the center of which is Detroit.

St. Paul, Minn.—The White Bear Automobile Co. will open a new garage May 1 at Sixth and Exchange streets, 90 by 150 feet, to cost \$80,000. The Republic Rubber Co. and the Prest-O-Lite company will be tenants. The same company is negotiating for a garage for the Columbus Buggy Co., St. Paul branch.

Milwaukee, Wis.—The Studebaker Corporation has changed its decision to close its branch at Milwaukee and turn over the Wisconsin business to George C. Grade & Bro., Reed street. It is now announced that the corporation has obtained new quarters in the Stroh building, Jackson and Michigan streets, and will continue its business as a direct factory branch. L. P.

Chittenden has been appointed branch manager.

Leipsic, O.—Hummon & Riley, of Ohio, has taken the agency for the Ford.

Shreveport, La.—Leo Gunning has contracted for the Oakland line for 1912 and has opened sales rooms in the building on Market street.

Baltimore, Md.—George R. Snodell, 3005 Garrison avenue, has the agency for Baltimore and the state of Maryland for the Guy Vaughn car.

Columbus, O.—The United States Carriage Co., of South Fourth street, has taken the central Ohio agency for the Rauch & Lang electric cars.

Lindsborg, Kas.—The Hagstrom Brothers Mfg. Co. has added a department for the manufacturing of dies, tools, special machinery and model making.

Columbus, O.—The Case company announces that its branch located at 456 North Front street, will act as distributor for the Case for all central Ohio.

Milwaukee, Wis.—Henry Newgard & Co. of Chicago, electrical contractors, supplies, etc., have established a branch at 276 West Water street, Milwaukee, Wis.

Baltimore, Md.—The Simplex car is again on the local market, G. A. Pope, Jr., having the agency. The garage is on Hamilton street near Park avenue.

Minneapolis, Minn.—T. M. Anderson, Peerless agency, has taken the Minneapolis district for the Westcott car. The Roller Motor Car Co. has taken the agency for five counties near St. Paul.

Philadelphia, Pa.—The Hess-Bright Co. has opened a new retail branch store at 666 North Broad street. Herman P. Schade, formerly of the Keystone Motor Car Co., of Harrisburg, is in charge.

Greenfield, O.—J. E. Upp & Son have closed out their repair business at Greenfield, Ohio, and in the future will only act as sales agent for the Cadillac. The headquarters of the concern will be at the Greenfield Auto Co.

San Francisco, Cal.—The Weinstock-Nichols Co., one of the largest accessory firms in the west, has moved into a large building on Golden Gate avenue, near Van Ness. The building covers a big area, and the firm occupies the entire three stories and basement.

San Francisco, Cal.—Kleiber & Co., northern California representatives of the Gramm motor truck and the Staver-Chicago pleasure cars, have leased quarters on Golden Gate avenue, near Van Ness avenue. Kleiber will retain his shops and warehouse on Folsom street.

Davenport, Ia.—A. C. Klemme, president and general manager of the Klemme Auto Co., has disposed of his interest in the company to accept the position of sales manager of a branch car factory in Denver. With the retirement of Mr. Klemme the Oldsmobile and Buick agencies will

be consolidated with headquarters at 114-116 Brady street.

Rockford, Ill.—John B. Freeman has secured the Franklin for this territory.

Sioux City, Ia.—The Interstate Auto and Supply Co. has added the Velie, Peerless and the Baker electric.

Janesville, Wis.—The Janesville Motor Car Co. is erecting a new garage and salesroom building on Court street, to be ready May 15.

Atlanta, Ga.—John Toole, who has represented the Stearns company at its Atlanta branch, has been sent by the company to take charge of its San Francisco branch. L. E. Bissell takes his place at Atlanta as manager.

St. Paul, Minn.—The Reed Motor Supply Co. has been organized at St. Paul by E. A. Reed, formerly secretary, treasurer and manager of the Electric Mfg. Co., to a general wholesale and retail supply business at 78 West Seventh street.

Lima, O.—W. E. Rudy has disposed of his stock in the Lima Blivins Motor Sales Co. to E. H. Hawisher and has retired from the motor car business, temporarily, at least. Mr. Hawisher will operate the sales agency and garage at 116-118 North Elizabeth street.

Moline, Ill.—Among the larger agencies recently appointed by the Velie Motor Vehicle Co. are the following: Barton-Ford Motor Co., Cedar Rapids, Ia.; Shreveport garage, Shreveport, La.; Vestal Motor Car Co., Pittsburg, Pa.; Stevens-Pearce Co., Toronto, Canada; F. E. Gilbert, Jackson-

ville, Fla.; W. L. Carter, Cumberland, Maryland.

Columbus, O.—O. G. Roberts, 933 East Gay street, has taken the 1912 agency for the Rambler in central Ohio.

Milwaukee, Wis.—S. T. Manlove has succeeded A. J. Borget in the purchasing department of the Beaver Mfg. Co.

Omaha, Neb.—The Omaha Automobile Co., Nyberg agent for Nebraska, South Dakota and Kansas, has secured a garage at 2010 Farnam street.

Washington, D. C.—The Auto Exchange and Supply Co., agent for the Bergdoll, has taken the Krit agency, recently handled by the Wilson Co.

Milwaukee, Wis.—The O'Neil Tire Protector Sales Co. of Cleveland, O., has appointed A. Weisskopf, 454 Thirtieth street, Milwaukee, distributor for the state of Wisconsin.

Columbus, O.—C. Roy Clough, formerly connected with the Early Motor Car Co. of Columbus, is now general sales representative of the King Motor Car Co. in Ohio, Kentucky and Indiana.

Toronto, Can.—Gibson's Electric, Limited has been incorporated under the laws of the province of Ontario, with a capital of \$40,000, to carry on the Canadian agency of the Hupp-Yeats electric cars.

Toledo, O.—The Abbott Motor Sales Co., of Toledo, has taken over the rooms recently vacated by the McLeary Engineering Co. The concern has just taken the distributing agency of northern Ohio for the Pope-Hartford pleasure cars and commercial vehicles. The concern will devote

its entire space at the old Madison avenue rooms to the selling and display of cars.

Louisville, Ky.—The Leyman Motor Co. has taken the agency for the R-C-H.

Bucyrus, O.—The Bucyrus Cycle and Auto Co., of South Sandusky street, has taken the local agency for the Krit. Samuel Hirtz is proprietor.

Detroit, Mich.—The W. J. Marshall Automobile Co., 703 Woodward avenue, has secured the dealership for Franklin cars in the Detroit territory.

Atlanta, Ga.—M. J. Gilbert, representing the International Motor Co., has opened offices in the Candler building and is making plans to establish a southern branch and a service station in the Gate City.

Chicago—Earl Chambers, who has been handling Velie cars for the past 3 years in Danville, Ill., has closed his salesroom and garage and has accepted a position with the Velie Chicago branch in the city sales.

Columbus, O.—The Sawyer Auto Specialty Co., has removed its plant from East Spring street to larger quarters at 43-49 Lafayette street. The company devotes its attention almost exclusively to the repair of brass parts.

Shreveport, La.—The Wray-Dickinson Garage and Sales Co., local representative of the Overland and Chalmers, is erecting a garage and service station at Spring and Fannin streets. The building will be constructed of steel and brick and will have a frontage on Spring street of 100 feet and a depth of 150 feet on Fannin street.

Youngstown, O.—Motor Necessities Co., capital stock \$5,000; incorporators, A. J. Black, C. T. Galtner, O. G. Delbel, C. A. Manchester and L. A. Manchester.

Lewisburg, W. Va.—Greenbrier Motor Co., capital stock \$10,000; to establish garage and salesroom.

Orangeburg, S. C.—Carolina Motor Co., incorporators, C. A. Stroman, N. T. Ziegler.

Hoboken, N. J.—Keller Auto Co., capital stock \$100,000; to manufacture machinery; incorporators, C. D. Bland, M. W. Gibbs, H. R. Blackburn.

Buffalo, N. Y.—Dayton Airless Tire Sales Co., capital stock \$10,000; to manufacture motor car tires; incorporators, J. Schoepflin, J. L. Sellman, A. L. Stratemeier.

Monroe, N. Y.—Monroe Garage Co., capital stock \$3,000; incorporators, W. S. Jessup, W. F. Griffin, H. S. Jessup.

New York—Packard Pleasure Car Renting Co.; incorporators, J. Kennedy, M. Kennedy, E. J. Shelley.

Brooklyn—Fairchild Electric Vehicle Co., capital stock \$50,000; incorporators, F. K. Fairchild, M. D. Fairchild, A. E. King.

New York—Reliance Rubber Co., capital stock \$1,000; incorporators, J. B. Bacon, S. R. Simpson, J. W. Ebbs.

Brooklyn—Long Island Commercial Car Co., capital stock \$9,000; incorporators, C. F. Lewis, C. I. Crowell, C. A. Moller.

Brooklyn—Waverly Storage Co., capital stock \$10,000; motor car trucking and storage; incorporators, J. F. McGuire, K. McCarthy, A. Sonnenstrahl.

Syracuse, N. Y.—W. D. Andrews Co., capital stock \$50,000; motor car supplies; incorporators, W. D. Andrews, R. Soroxton, E. L. Andrews.

Cincinnati, O.—Cincinnati Sightseeing Automobile Co., capital stock \$30,000; incorporators, W. E. Kreidler and others.

Jersey City, N. J.—Excelsior Specialty Co., capital stock \$30,000; general motor car business; incorporators, F. Thomassin, F. D. Lockwood, A. Higson, G. H. Martens, C. S. Goodfellow.

Monticello, Ind.—Clifford Automobile Co., capital stock \$15,000; directors, T. W. O'Connor, Michael Clifford and E. J. Sexton.

Recent Incorporations

Chicago—J. J. Meersman Co., capital stock, \$5,000; to manufacture electrical specialties; incorporators, J. J. Meersman, W. A. Huppert, R. M. Bilheimer.

Wilmington, Del.—Tire Trading Co., capital stock, \$50,000; to manufacture tires.

Galesburg, Ill.—Taxi Livery Co., capital stock, \$5,000; engage in motor car livery; incorporators, Fred Peterson, R. Moore, Charles Miller.

Camden, N. J.—Peerless Roller Bearing and Appliance Co., capital stock, \$300,000; to manufacture roller bearings, etc.; incorporators, W. H. Kneidler, I. Michener, W. J. Moore, J. R. Jarrett.

Louisville, Ky.—Louisville Carriage and Taxicab Co., capital stock, \$200,000; incorporators, J. E. Roche, G. E. Roche, L. K. Delph, B. W. Bingham.

Salem, N. Y.—Salem Automobile Service Co., capital stock, \$25,000; to operate motor cars for hire; incorporators, G. D. Jaquette, A. Lawrence, C. E. Jaquette and W. E. Allen.

Detroit, Mich.—Cyclo Carburetor Co., capital stock, \$4,000.

Detroit, Mich.—Detroit Auto Training School, capital stock, \$5,000.

Detroit, Mich.—Keeton Motor Co., capital stock, \$10,000.

Detroit, Mich.—United States Starter Corporation, capital stock, \$10,000.

Brooklyn, N. Y.—Blue Taxi Co., capital stock, \$600; incorporators, S. H. Miskind, H. M. Bamberger, Mitchell May.

New York—Bryant Sales Co., capital stock, \$15,000; to manufacture motor cars and motor cycles; incorporators, W. B. Hagerty, F. V. Mansfield, M. E. Wilson.

Buffalo, N. Y.—Swiss Magneto Co., capital stock, \$250,000; to manufacture magnetos and ignition devices; incorporators, H. S. Martin, A. R. Meggett, B. H. Phillips.

Yonkers, N. Y.—Riverdale Avenue Garage; capital stock, \$2,500; incorporators, M. Rosenfelder, G. Rosenfelder, J. Ennesser.

New York—Empire Auto Top Co., capital stock, \$10,000; incorporators, B. Garabrant, M. Mackenzie, J. J. Hayden.

Albany, N. Y.—Moyer Auto Sales Co., capital stock, \$5,000; incorporators, S. C. Shaver, W. B. Phelps, W. R. Rose.

New York—Terminal Auto Co., capital stock, \$10,000; incorporators, G. N. Pearsall, S. J. Kidder, F. R. Hilton.

Forth Worth, Tex.—Motor Car Specialty Co., capital stock, \$5,000; incorporators, E. E. Gose, F. H. High and R. R. Gilliland.

Hempstead, N. Y.—Nassau Auto Co., capital stock, \$3,000; incorporators, O. L. Schwenke, Jr., P. Schwenke, E. F. Schwenke.

Detroit, Mich.—A. C. Knapp Co., capital stock, \$20,000; to manufacture motor car parts and accessories; incorporators, A. C. Knapp, L. A. Droelle and W. S. Harrison.

Willimantic, Conn.—Trumbull Auto Parts Co., capital stock, \$11,000; incorporators, D. A. Trumbull, F. J. Wood, W. M. Trumbull, A. Trumbull, E. G. Wood.

Grand Rapids, Mich.—Page Auto Holst Co., capital stock, \$10,000; to manufacture motor car holsts.

Boston, Mass.—United Service Auto Co., capital stock, \$10,000; to deal in motor cars; incorporators, R. B. Skinner, W. L. Thomas, L. A. Brimmer, H. L. Baker.

Camden, N. J.—Motor Gasoline Co., capital stock, \$50,000; to manufacture products from natural gas, petroleum, etc.; incorporators, V. A. Murray, L. A. Myers, M. Breenan.

Monticello, Ark.—Clifford Automobile Co., capital stock, \$15,000; directors, T. W. O'Connor, M. Clifford, E. J. Sexton.

Los Angeles, Cal.—Reliable Garage Co., capital stock, \$10,000; directors, H. H. Teames, L. C. Elliott, A. M. Strong.

Boston, Mass.—Wallaston Center Garage Co., capital stock, \$25,000; incorporators, A. C. Winslow, M. McQuade.

Boston, Mass.—Harry F. Grant Co., capital stock, \$50,000; incorporators, H. F. Grant, H. F. Grant.

Philadelphia, Pa.—United States Motor Tire Co., capital stock, \$20,000.